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Mitchel Field Air Carnival—Formation Flying by Martin Bombers

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NUMBER 21

SPECIAL FEATURES

MITCHEL FIELD AIR CARNIVAL.
WATER BALLAST RECOVERY FOR AIRSHIPS
THE ENGLISH LIGHT PLANE MEETING
COST ACCOUNTING IN AERIAL TRANSPORTATION

THE GARDNER, MOFFAT CO., INC.
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CONTENTS

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AVIATION

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Lessons of the Lympne Meeting

THE lessons to be learned from the English Light Plane Meeting held at Lympne are, in the first place, that low powered airplanes are not necessarily "fair-weather" machines, for the competitors flew generally in very bad weather. Nor is this disproven by the untimely death of Alexis Maneyrol, one of the best glider and light plane pilots, who was killed when the wings of his Peyret plane folded up on pulling out of a fairly steep glide, for the DH53 light plane was looped and rolled right afterward by Captain Broad, thus proving that some light planes have all the structural strength required for safe operation. The Lympne meeting proved for one thing that light planes can be made as airworthy as any big plane.

In the second place, it proved that light planes are not necessarily "tangent"—or devoid of reserve power—for the ANEC plane went up 14,400 ft., one Avro 13,850 ft. and the Peyret 9,400 ft.

Another favorite argument of the "anti-light-plane" school was exploded at Lympne when the Parnall "Pixie" made a speed of 76.5 m./hr. with a 750 cu. cm., Douglas motorcycle engine. The adversaries of the light plane generally argue that the low maximum speed of light planes places them at the mercy of high winds so that their practical value as a vehicle of sport is negligible. The performance of the "Pixie" is a telling reply to these views.

Fourth, the light planes proved at Lympne that some of the small engines fitted to them are quite reliable. Bert Hinkler on his little Avro covered 1,000 miles in six days, making eighty circuits of the 12.5 mile course, without having a single engine failure. This wonderful performance also demonstrated that it does not require any particularly strenuous effort to pilot these little ships.

Fifth, the fuel economy demonstrated at Lympne is really a revelation and should spur aircraft designers to profit by this lesson. Two machines of different designs demonstrated a fuel economy of 87.5 mi./gal.—the "Wren" and the ANEC—while another ANEC plane made 82.5 miles to the gallon.

Sixth, and last, the Lympne meeting revealed that it is possible to build a light plane that will land with a short run instead of "kiting" all over the field, as was the case with the early French machines of this type, for none of the English contestants seems to have had much trouble on that score.

Altogether, the British light plane constructors deserve to be congratulated on the splendid showing their machines made at Lympne, which has set a new stepping stone in the development of low powered airplanes.

We believe that this meeting has proved beyond doubt that the light plane is here to stay and that its usefulness is beyond any question. Light planes can be used for private touring, as they have a low landing speed, their operation is not difficult or dangerous, and their upkeep is inexpensive. They can also be used by the government for supplying Reserve officers with a machine on which they can "keep their hand in" at a cost much below that required in "refreshing" them in reserve training camps.

If the British can build light planes capable of the excellent performances shown at Lympne, we certainly can do at least as well, and probably better, judging by the world's records made by American aircraft during 1923. What we need now, is encouragement that will bring forth some American light planes.

Helicopter vs. Swimming Pool

THE news that the hangar which used to house the "hush-hush" helicopter of McCook Field will be converted into a swimming pool accompanies the announcement that this direct lift machine will henceforth be seen in the Air Service Technical Museum.

The temptation is great to say that in this way some use will be made of the money spent on the D B helicopter, and that a swimming pool is a better asset to a flying field than a helicopter hangar. However, there is another angle to this controversial question. Suppose for a moment that some foreign helicopter had suddenly displayed an astonishing performance, and nothing had been done by the Air Service to study the possibilities of such an aircraft. The inference is clear: public clamor would have rent the skies as to our backwardness in aeronautical development and our lack of foresight. Two hundred thousand dollars spent in an endeavor to "lift off" vertically to a height under 10 ft. may seem a bit extravagant—but on the other side of the ledger stands the fact that the Air Service now knows what it can expect of a helicopter. And that is all to the good.

Assistance for Civil Aviation

ASSISTANCE for civil aviation can assume diversified forms, and need not involve the controversial question of outright government subsidies, to which a large body of Americans are unalterably opposed. This is well proved by the valuable public service performed by the Governors of Alabama and Utah in issuing proclamations to their constituents, urging the establishment of landing fields at the principal towns and cities with proper facilities and markings.

It is hoped that the far-seeing attitude of the Governors of Alabama and Utah will not only bear fruit in their respective States, but that it will also be followed by the Governors of other States. All those that are in any way concerned with aviation should lend their assistance to this end.

The English Light Plane Meeting at Lympne

Performances: Speed, 76.5 mi.-hr.; Ceiling, 14,400 ft. Economy, 87.5 mi.-gal.

The Light Plane Meeting which was held from Oct. 8 to 13, last, at Lympne, England, resulted in some very good performances despite rather inclement weather.

Twenty-eight entries were received for this meet which was liberally endowed with prizes for speed, altitude, fuel economy and reliability. The reliability trials were run over a circuit of 12.5 mi., first prize going to the entrant making the greatest number of laps. The engines of the competing ships were limited to a maximum cylinder capacity of 750 cu. cm., but otherwise designers were given complete freedom in the design of their ships.

The Prize Winners

Following is the list of prize winners —

The Duke of Sutherland's prize of £500 and the *Daily Mail* prize of £1,000, offered for the greatest distance flown on one gallon of gasoline, are divided evenly between Flight-Lieutenant Longton, who flew the English Electric Company's "Wren" (No. 4), 398 cu. cm. ABC engine, and "Jimmy" James, who piloted the ANEC monoplane (No. 17), 700 cu. cm. Blackburne engine. The mileage attained by both was 87.5 mi./gal.

The Abdulla prize of £500, offered for the greatest speed attained, was won by Captain Macmillan, who was flying a Parnall "Pixie," with 750 cu. cm. Douglas engine. Macmillan's speed was 76.5 mi./hr.

The prize of £200 offered by Sir Charles Wakefield for the greatest height attained was won by Maurice Piercey, flying the same machine used by James in winning the economy competition (ANEC monoplane, No. 17). Piercey's best height was 14,400 ft.

The two prizes of £150 each, offered by the Society of Motor Manufacturers and Traders and by the British Cycle and Motor-Cycle Manufacturers' and Traders' Union, for the greatest total mileage covered during the meeting, was won by Bert Hinkler on an Avro monoplane, with 700 cu. cm. Blackburne engine, who covered 80 laps of the course, of a total distance of 1,000 mi.

A prize of £100, offered by the Duke of Sutherland and members of the Royal Aero Club for a landing competition, was awarded to Captain Humersley as an appreciation of his fine performances in taking the little Avro biplane, 500 cu. cm. Douglas, up to a height of 13,850 ft., the gusty wind having prevented the landing and getting-off competition from being held.

The Duke of Sutherland has already declared his willingness to offer another prize next year. This will probably be for two-seater light planes in which case the limit on engine capacity will probably be increased to about 1,200 or 1,500 cu. cm.

It is also understood that Sir Samuel Hoare has intimated the probability of the Air Ministry offering a prize next year, so that the holding of English light plane competitions seems to be in a fair way to become an annual event of considerable importance.

Principal Performances and Characteristics

The principal performances obtained by the twenty-one light planes which actually flew at the meet, together with the main characteristics, are listed below through the courtesy of our London contemporaries *The Aeroplane* and *Flight*.

Machines are listed here in their program order and with their entry number. Such entries as failed to materialize have been omitted. Mileages recorded are officially observed completed laps of the 12½ mi. course only. Much unofficial flying was done by all machines.

No. 2. Gnosspelius "Gull" (698 cu. cm. Blackburne). J. L. Parker, pilot. Speed 55.25 mi./hr. No. 19, piloted by Capt. R. H. Stocken, is a sistership.

This machine has been flown at Lympne during the past five months by Lankester Parker. It is shown in one of Mr. Bridgman's sketches herewith. It is a thin-winged cantilever biplane fitted with a 698 cu. cm. Blackburne engine driving two pusher propellers by chains.

Span 36 ft. 3 in. Length 19 ft. 6 in. Chord 5 ft. 6 in. Area 142 ft. Wt. empty 402 lb. Wt. loaded 500 lb.

No. 3 English Electric Co.'s "Wren" (400 cu. cm. ABC) S/Ldr. M. Wright, pilot. Consumption 82.5 mi./gal. Total mileage 175 mi. (14 laps).

No. 4 English Electric Co.'s "Wren" (400 cu. cm. ABC) F/Lt. W. Longton, pilot. Consumption 87.5 mi./gal. (Tied with No. 18 for Sutherland and *Daily Mail* Prizes—£750.) Total mileage 362 mi. (29 laps).

These machines are slight modifications of the original "Wren." In the original version the leading edge of the wing was swept back and the trailing edge was swept forward to approximately the same degree. In the new machine the front spar is straight, and there is a much greater sweep back on the trailing edge, that is the wing is effectively swept forward slightly which compensates for a slight reduction in the weight of the tail. The tail has been reduced in span, so as to pass the 7 ft. 6 in. gage in the transport test, and the rudder and fin are slightly modified.

It is rumored that ABC engines of a higher compression ratio than those of the first "Wren" are to be used.

Span 37 ft. Length 24 ft. 3 in. Chord 5 ft. Area 150 sq. ft. Wt. empty 232 lb. Wt. loaded 408 lb.

No. 5 A. V. Roe and Co.'s Biplane (Grigg engine). Pilot Bert Hinkler. No official figures. Flew very little.

This machine is a small tractor biplane with RAF15 wings and a very marked stagger. The design is quite conventional except for the omission of an undercarriage—the axle being inside the fuselage with only part of the wheels projecting.

The fuselage is a three-ply covered box-girder, and the wings are of normal two-spar construction.

Span 30 ft. Length 19 ft. 6 in. Chord 3 ft. Area 166 sq. ft. Wt. empty 294 lb. Wt. loaded 480 lb.

The Avro Entries

No. 6. A. V. Roe and Co.'s Monoplane (698 cu. cm. Blackburne). Pilot Bert Hinkler. Consumption 63.3 mi./gal. Total mileage 1,000 mi. (80 laps).

This machine has a cantilever wing of very thick biconvex section at the roots, with a quite considerable taper in both chord and section toward the tips. The two spars are of box section—spruce with three-ply sides, and thanks to their great depth are extremely rigid, which should help in avoiding control troubles.

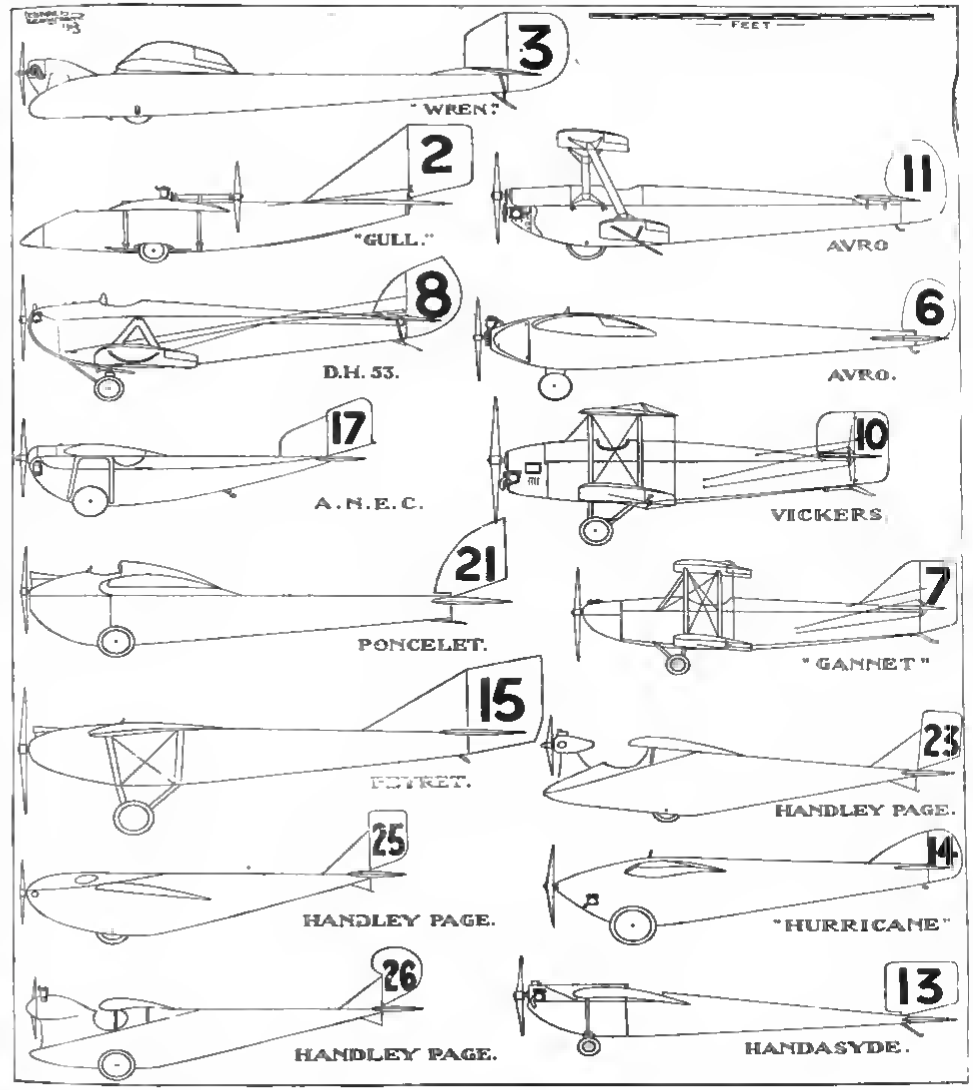
The wing is mounted on top of a square section fuselage of very clean shape, carrying a Blackburne engine in the nose and the pilot's cockpit between the two wing spars. A rudimentary undercarriage projects below the fuselage. The tail consists of a fixed tail-plane, divided elevators and a balanced rudder. No fin is fitted. The propeller is directly driven. The machine is very light, the wing loading being under 3½ lb./sq. ft.

Span 36 ft. Length 21 ft. Chord 5 ft. 4½ in. Area 138 sq. ft. Wt. empty 285 lb. Wt. loaded 470 lb.

No. 7 Gloucestershire "Gannet" (Carden engine). Pilot L. L. Carter. No official records. Flew, but engine trouble prevented official tests.

This is a very small folding tractor biplane of 18 ft. span, fitted with a new "Carden" two-cylinder vertical two-stroke engine. The machine has been produced more to demonstrate what can be done in the way of building a cheap, simple and practical low-power single-seater than with an eye to the winning of prizes. From the private owner's point of view the simplicity of the two-stroke is an obvious advantage which may entirely counter-balance its relative inefficiency.

The "Gannet" is in fact a small airplane of the normal



Courtesy THE AEROPLANE

Side elevation views, to same scale, of English light planes at Lympne meeting

tractor type having an peculiarities other than its small size. The wings are of the thick section which has been used in the more recent Gloucester designs, and built on the standard two-spar system with channelled spruce spars and spruce girder ribs.

Normal single bay wing bracing, steel tube interplane and center section struts, steel tube "Vee" undercarriage and a perfectly normal tail unit of fixed tail plane, divided elevator, fixed fin and rudder go to complete the machine. The pilot's cockpit is beneath the top center section.

Span 18 ft Length 16 ft. Chord 3 ft. 6 in. Area 103 sq. ft. Wt. empty 283 lb Wt. loaded 460 lb

A DH Baby

No. 5 De Havilland 53 (750 cu. cm. Douglas) Pilots Captain de Havilland and Capt. H. S. Broad. Consumption 50.8 m./gal. Total mileage 100 m. (8 laps)

No. 12 DH53 (750 cu. cm. Douglas). Pilot Maj. H. Hemming. Consumption 59.3 m./gal. Mileage 387 m. (31 laps).

These are "low-wing" types of monoplane with struts from the top rail of the fuselage out to about one-third of the half-span on each spar. The wings are of parallel chord throughout, of quite thick section at the point of application of the struts, but tapering in thickness both toward the body and the tips. The fuselage is rectangular in section, tapering to a vertical knife edge aft, and with the usual turn up to the engine mounting in front.

The pilot sits over the wing spars, and the undercarriage is a diminutive edition of the standard DH undercarriage with rubber shock absorbers in the apex on the rear leg.

Span 30 ft. 1 in. Length 19 ft. 8 in. Chord 4 ft. 6 in. Area 120 sq. ft. Wt. empty 310 lb. Wt. loaded 490 lb.

No. 9 Parnall "Pixie" (500 cu. cm. Douglas). Pilot Capt. N. Macmillan. Consumption 53.4 m./gal. Total mileage 125 m. (10 laps)

This is another "low wing" monoplane very similar in general arrangement to the DH53, but of somewhat smaller dimensions and fitted with a geared down Douglas engine of 500 cu. cm. capacity. The machine is illustrated. No details are yet available.

No. 4, a sistership fitted with a 750 cu. cm. Douglas engine, made a speed of 76.5 m./hr. (Abdulin speed prize)

A Small Vickers

No. 10 Vickers "Pigot" (750 cu. cm. Douglas). Pilot Capt. S. F. Cockerell. Speed 58.1 m./hr.

This is a normal standard tractor biplane on a reduced scale, fitted with a 750 cu. cm. Douglas driving a huge propeller through a chain gear. The machine has been likened—not unjustly—to a model of an SE5, and is a very excellent specimen of high-class workmanship and design.

Span 25 ft. Length 17 ft. 3 in. Chord 4 ft. 3 in. Area 200 sq. ft. Wt. empty 395 lb. Wt. loaded 575 lb.

No. 11. Avro Biplane (500 cu. cm. Douglas). Pilot Captain Hamersley. Altitude 13,850 ft. (Second altitude prize—£100.)

This machine is of the same design as No. 5, described above. The propeller is chain-driven.

No. 13 Handasyde Monoplane (750 cu. cm. Douglas). Pilot F. P. Raynham. Consumption 65.7 m./gal. Mileage 162 m. (13 laps)

Mr. Raynham's ship is of a very similar design to that of his Itford glider. The fuselage is a rectangular section throughout covered box-girder with a very stiffly-built thick wing placed on the top thereof. The pilot sits between the spars, and the engine is mounted on the top of the upturned nose of the body. A rudimentary undercarriage consisting of two deep struts carries a steel tube axle about 6 ft. long and a pair of small wheels.

The propeller is direct driven at about 2,500 r.p.m.

Span 30 ft. Length 19 ft. 2 in. Area 135 sq. ft.

No. 14 R.A.E. Aero Club "Hurricane" (600 cu. cm. Douglas). Pilot F/Lt. P. Balman. Speed 58.5 m./hr.

This is a cantilever tractor monoplane, of very small wing area and of a distinctly high wing loading (7.8 lb./sq. ft.) for a light plane. The wing is of a Göttingen thick section or rather of a selection of such sections, tapering in chord and in thickness from root to tip.

The fuselage is somewhat unusual, as it is of triangular section, very deep relatively to its height, and this fuselage is balanced so to speak upon a single leaf spring attached to the lower longeron which serves as an axle.

The engine is mounted low in the fuselage with only its cylinders projecting on each side, and driving the propeller through chain-gear.

The pilot sits between spars with his head well above the wing.

Span 23 ft. Length 16 ft. Area 80 sq. ft. Wt. empty 375 lb. Wt. loaded 565 lb.

No. 15 Peyret Monoplane (748 cu. cm. Sergant). Pilot M. A. Maneyrol. Altitude 9,400 ft. Wings folded up on flattening out from steep glide. Pilot killed.

This machine bears no resemblance whatever to the Peyret glider with which M. Maneyrol won the Itford gliding prize. It is a normal tractor monoplane with rigidly braced wings

P. & A. Paste

English light planes—Top, Handasyde (No. 13), piloted by Raynham; bottom, Parnall "Pixie," piloted by Macmillan

and a normal undercarriage. The engine is a four cylinder vertical air-cooled Sergant engine with a built in reduction gear and cooled by air forced into a scoop by the propeller blast. The engine is very heavy (over 100 lb.)

Span 32 ft. 4 in. Length 18 ft. 3 in. Area 164 sq. ft. Wt. empty 375 lb. Wt. loaded 515 lb.

No. 16 Poncelet Monoplane (748 cu. cm. Sergant) Pilot Baron G. Kervyn de Lettenhove. Belgian construction.

The Poncelet machine which has flown excellently in France and Belgium, is not unlike the ANEC machine in general arrangement but it is devoid of all external wing bracing. The engine is the same as that used in the Peyret mentioned above. This machine is a sister to No. 21, flown by Lt. V. Simonet, which made a speed of 58.1 m./hr.

Span 36 ft. 6 in. Length 21 ft. 6 in. Area 215 sq. ft. No other data available.

The ANEC Monoplanes

No. 17. ANEC Monoplane (698 cu. cm. Blackburne) Pilots J. H. James and M. W. Piercey. This machine cracked a cylinder early in the meeting and was thereafter kept in reserve to No. 18.

No. 18 ANEC Monoplane (698 cu. cm. Blackburne) Pilots J. H. James and M. W. Piercey. Consumption 87.5 m./gal. (Tied with No. 4 for Sutherland and *Daily Mail* Prize—£750.) Mileage 775 m. (62 laps). Speed 74 m./hr. Altitude 14,400 ft. (Winner of Wakefield Prize.)

These machines are "high wing" monoplanes of the same type and have already been described in AVIATION. They are very clean jobs and are of particular interest on account of their inverted Blackburne engines. No. 18 was flown 775 m. during the meeting without engine failure. The only attention given the motor was the cleaning of spark plugs, which may have fouled because of the inverted position of the motor.

Span 32 ft. Length 15 ft. 7 in. Area 145 sq. ft. Wt. empty 290 lb. Wt. loaded 470 lb.

No. 25 Handley Page Monoplane (400 cu. cm. ABC.) Pilot Capt. C. Barnard. Mileage 37.5 mi. (3 laps).

This is a cantilever monoplane of a design very similar to the Courtney-Sayers-Wright glider of the Itford gliding meeting. The engine is mounted on a streamlined pulpit over the nose of the fuselage and drives the propeller direct. It is fitted with ailerons of very high aspect ratio, which have a permanently opened Handley Page slot. The machine has been shown to possess a very low stalling speed and a very great controllability.

Span 36 ft. Length 17 ft. 7¾ in. Chord 4 ft. 10 in. Area 157 sq. ft. Wt. empty 250 lb. Wt. loaded 430 lb.

Water Ballast Recovery for Airships

By LT. COL. IRA F. FRAVEL

Chief of Lighter-than-Air Section, Army Air Service

With the completion of the world's largest airships, and the extremely successful trial flights which have lately been accomplished, much attention is being focused on lighter-than-air craft for air navigation. Coincidently, the use of helium as a lifting gas in place of hydrogen has assumed equal importance because of its reduction of fire hazard. Because of its non-inflammability it is naturally at once the choice for both military and commercial craft. However, the limited supply available and its high cost has in the past been much

had been developed at the Washington Navy Yard by H. S. McDewell. While the Navy Yard apparatus showed some promise of success, it, like the British attempts, was not sufficiently interesting to the Navy to continue the work. The efforts of Mr. McDewell were, however, of value inasmuch as the information he had gained was very kindly put at the disposal of the Bureau of Standards, when work began there on a similar project for the Army Air Service.

Late in 1920 the Army Air Service requested the Bureau

Securing water ballast from the exhaust—On the left, condenser developed by the Bureau of Standards and the Army Air Service, under test on the ground, on the right, the condenser is shown rigged in the Army airship

of a handicap. This has been especially true, because to maintain equilibrium it is necessary at times to "valve," or in other words let some of the gas escape in order to compensate for the weight of fuel consumed, or on account of the expansion of the gas due to the heat of the sun's rays, etc. With another huge airship—the ZR3—nearing completion for the United States, the problem of the preservation of helium gas if it is to be used in these ships, has become one of vital importance.

In an effort to solve the problem, government engineers have been working along the line of compensating for the weight of the fuel used by recovering some of the moisture in the exhaust gases from the engine and, in addition, attempting to find a method by which the supporting or lifting gas can be maintained at a constant temperature in order to prevent variations in lift due to expansion or contraction.

History of Development

Attempts to compensate for the weight of the fuel consumed by the recovery of the water vapor component formed as a product of combustion from the exhaust gases from the engines is by no means new. As early as 1915, at least, the British government made some efforts in this direction, as indicated by reports of the British Advisory Committee for Aeronautics in a paper by Guy Barr, which was printed in September of that year. The apparatus, said to be partially successful, was not of sufficient promise at the time to warrant the continuation of tests.

Some time prior to 1920 a type of water recovery apparatus

of Standards to attack the problem and, if possible, evolve a practical apparatus for accomplishing the purpose indicated above. The results of this effort are evidenced by the recent successful trial flights of the Army airship D3 at Langley Field and the Aberdeen Proving Grounds. Although the experiments were financed and sponsored by the Army Air Service, too great credit cannot be given to Bureau of Standards scientists for developing a really successful device in view of the crude examples which had previously been built and the subsequent abandonment of the project by other agencies. When it is remembered that the work of the Bureau of Standards did not commence until after September, 1920, and that the apparatus was successfully operated and flown for more than 52 hr. by August of 1922, the rapidity with which this work progressed is apparent.

Details of Construction

Some of the details of the design and construction made use of will be of interest. It has long been known that for every pound of fuel economically consumed there is available in the exhaust gases more than 1.4 lb. of water vapor. If this moisture can only be separated, there would be afforded, therefore, an ample margin to allow for inefficiency in the apparatus and still maintain constant weight. The problem is then one of designing an appropriate water separator which will be light enough to warrant its use. Obviously, a water separator for this purpose must be in the form of a condenser, in some respects similar to that used in steam power plant design.

In the earlier types of condensers built for the purpose of securing water ballast from the exhaust, water was used as a medium for cooling the gases coming from the engine. This water naturally became heated in the process and itself had to be cooled before it could be used again. Radiators for this purpose were necessary and, in addition to their weight, there had to be added the weight of the circulating water. The Bureau of Standards, after a preliminary investigation, decided that if condensers could be built to secure direct cooling of the exhaust gases by air, a distinct advantage would have been gained. In this way a great deal of weight and much extra equipment could be eliminated. After gathering all of the data pertaining to the theoretical and mechanical problems involved in such construction, it was decided to proceed along this line. That such a decision was wise is proven by the fact that the two successful models which have already been built and tested are of the direct air cooled type and weigh about one and one half pounds per engine horse power, while the best of the water cooled types could probably not be built to weigh less than six or seven pounds per brake horse power.

The condenser, or water ballast recovering device, as may be seen in the accompanying photographs, consists of a series of long slender pipes or tubes through the inside of which gas is conducted on its way from the exhaust manifolds of the engine to the atmosphere. The air sweeping over the outside of the pipes as the airship is in motion cools the gases and the condensed water vapor is drawn off from the separators through appropriately located drains. The efficiency of the device is sufficient to produce enough water to weigh approximately the same as the fuel consumed.

The condenser itself is made up of aluminum and aluminum alloys. The tubes are about 0.022 in. in wall thickness and 1 in. outside diameter. In all, approximately 3000 ft. of tubing are used. The actual weight of the apparatus, sufficient to take care of the exhaust from two 150 hp. engines, is around 450 lb. The preliminary tests made at the Bureau of Standards were made with a standard Liberty engine to furnish both the exhaust gases and the air for cooling. The condenser tubes were set up in the slipstream of the propeller with an inclination toward the rear so that the air would pass to a certain extent laterally across the pipes.

In order to simulate as much as possible actual flying conditions, the unit was suspended from cables in a manner similar to that by which it was later installed on the airship. The "set up" for the experimental test runs, as well as the actual flight test, may be seen in the accompanying illustrations.

What Remains to be Done

As has been mentioned above, successful operation during the test flights of this apparatus has been accomplished some time ago. The next step that will be apparent will probably be the regular installation of similar devices on all service airships. The problem, then, of compensating for the weight of the fuel consumed has been solved, and there remains only that of maintaining the desired temperature of the lifting gas. Work is already in progress along this line and much preliminary data available.

The importance of this work, now that it has been definitely decided to use helium in place of the more dangerous gas, hydrogen, cannot be overestimated. By such methods not only will much valuable gas be saved, but undoubtedly the unit price considerably reduced by the conservation of that already in existence.

The Mitchel Field Air Carnival

A crowd estimated at 25,000 persons enjoyed the various events of the Air Carnival given at Mitchel Field, Garden City, L. I., on Election Day, Nov. 6, for the benefit of the Army Relief Society. Approximately 12,000 persons paid admission, while the rest lined the highways skirting the field.

About 100 planes had been brought from various flying fields to participate in the events. The Navy contributed Lieuts. Alford Williams and Harold Brow, who have been swapping speed records lately in their Curtiss racers. It would have sent the Shenandoah (ZR1) to fly over the field, but the weather was unfavorable.

The Planes Present

All planes were lined up for inspection along the enclosure. They included the L.W.F. "Owl," Martin Bombers, DH4B's, Thomas-Morse MB3's, U. S. Messengers, Vought VE7's, U. S. Mail planes, a Fairchild "Sport," various Orioles and Jennies from nearby fields, the Nordmann glider, and the Curtiss pusher biplane on which Glenn H. Curtiss won the first Gordon Bennett airplane trophy race.

The flying events started with aerobatics performed by Lieutenants Ramey and Wade in Vought planes. This was followed by a formation flying contest engaged in by five DH4B's from Mitchel Field and ten Hisso Jennies, in two formations of five each, by members of the Air Service Reserve Corps. This contest was won by the Mitchel Field formation, commanded by Capt. M. F. Brady, but the Reserve fliers, as it said in all fairness, also performed extremely well.

Then, under cover of a smoke screen laid by Sergeant Hudson, five Martin Bombers of the 2nd Bombardment Group engaged in battle practice. The huge "Owl" lumbered across the skies with an escort of two Messengers which now stunted around it, now followed like watch dogs. Lieut. Philip Melville, A.S., the pilot of the "Owl," handled the big ship with remarkable skill, and it is believed he could have stunted her if that were possible.

A race over a 30 mi. course from a standing start, for the Hitchcock Trophy, open to Air Service observation planes, was won by Lieut. Victor Bertrandias, A.S., of the 61st Service Squadron. Lieut. Edwin Johnson, A.S., won the Cordway Trophy race, a 30 mi. free-for-all event for Liberty engined planes. The U. S. Air Mail gave a demonstration of mail transfer by planes from the Hempstead station, and this was followed by an exhibition of wing walking performed by Claude Hening.

Then came a wonderful exhibition of fighting maneuvers and formation stunting by three MB3's of the 1st Pursuit Group which were piloted by Capt. Burt E. Skeel, Lieut. O. Hunter and Lieut. T. K. Matthews. Finally these pilots flew low over the field with the wings practically vertical so that the ships depended for lift on the body surface instead of on the wings—a most difficult and dangerous maneuver, which fortunately came off without an accident.

Army and Navy enlisted men participated in a parachute contest from a Martin Bomber which was doubly exciting by virtue of the methods adopted by the entrants to reach the earth first. By manipulating the ropes of the chute they were enabled to "let the air" out, increasing their downward flight. The event was won by Sergt. Randall Bose, attached to Mitchel Field.

Navy-Curtiss Racers Perform

Then the Navy-Curtiss racers began to tune up their engines. Every ship in the air was ordered to land and none was permitted to take off from the ground until the race was ended. Many expected to see another world's record broken, but neither Brow nor Williams had any intention of trying for a new record, because they had been expressly forbidden by Admiral Moffett, head of the Naval Bureau of Aeronautics, further competition along these lines.

Williams took off first, whizzing over the field, flying sidewise and doing a few stunts by way of diversion. He was followed by Brow, who performed similar maneuvers.

Capt. Charles Nungesser, one of the leading aces of the French flying corps, with his bride, who was Miss Consuelo Halmaker, and Capt. W. H. Waters, A.S., her stepfather, were interested spectators.

"If I had a plane like that," Captain Nungesser said, "and two machine guns I could drive down anything."

Just to satisfy some people's curiosity as to how fast a Curtiss racer could climb Williams went up 5,000 ft. in one minute.

Photo International

Gliding experiments at Mitchel Field, L. I.—The Nordman glider piloted by A. O. Heinrich in free flight, after casting off the rope by which a motorcycle was towing it off the ground

The last event ended in a burst of flame that cast a warm glow over the cold, damp semi-darkness. A kite balloon was released and an airplane piloted by Capt. R. Kinlock, A.S., attacked it, setting it on fire with one shot. The blimp came down in a stream of flame and smoke and the carnival was ended for the day.

The Second Carnival

As the threatening rain clouds evidently interfered with the attendance, Maj. William N. Hensley, A.S., commandant at Mitchel Field, repeated the air carnival with several added attractions on Saturday, Nov. 10. This second event drew a crowd of about 10,000, few of whom left until the last event as the Mitchel Field fliers put on a show that was replete with interest. A miniature village, constructed in the center of the field, gave Army aviators an opportunity to give a realistic demonstration of bombing a city. "Enemy" planes attacked the village with real bombs and made short work of the houses and imaginary inhabitants. The burning village made a thrilling sight from the grand stand. An observation balloon used in the defense of the place, was shot down in flames, the burning gas and bag illuminating the field for miles around in the dusk.

A fatality unfortunately marred this day, when Pvte. Aage Rasmussen of the 62d Service Squadron fell to death after being carried aloft by a handling line of the Army airship TC2, which he failed to let go while the ship was rising. The TC2, coming from Aberdeen Proving Grounds, Md., was almost securely held by the ground crew, when a sudden expansion of hydrogen sent her up again. The ship was "light" on account of 500 gal. of fuel burned on the trip and, as a consequence, answered her helm badly. Rasmussen, who belonged to the handling crew, probably did not hear the command to "let go," and was carried up some 500 ft. with the ship. He managed to wind the rope around his leg, and was holding fast until the ship was within 50 ft. from the ground, when his forces failed him and he dropped to instant death.

The fatality prevented the plans which had been made to tow the Nordman sailplane into the air and release it from a height of 2,000 ft. The inventor was certain that from that height the favoring currents would aid him in setting up a new glider record. In order not to disappoint the crowd, which was keenly interested in the motorless plane, Arthur Heinrich made a short flight, propelled into the air by a motorcycle which towed the craft at full speed over the field. The sailplane remained in the air almost two minutes.

With the permission of Rear Admiral Moffett, chief of the Naval Air Service, Lieut. Edward Johnson, A.S., gave an exhibition in the Navy-Curtiss racer with which Lieut. A. J. Williams captured the world's speed record. Lieutenant Johnson performed aerial aerobatics at a speed of 250 mi./hr. The Messenger and the Owl were piloted by Capt. R. A. Kinloch and Lieut. Philip Melville, respectively, in a demonstration of contrast.

An Army versus Navy parachute leap from 2,000 ft. was won by A. F. Starr of the Navy. L. H. Ford, another Navy contestant, was bruised when he bounded 5 ft. after reaching the earth. Other features of the meet were races over a 30 mi. course, formation flying, wing walking, smoke screen laying and stunt flying.

Handbook for Curtiss D12 Engine

The Curtiss Aeroplane & Motor Co. has produced an attractive handbook for the Curtiss D12 aircraft engine which gives a clear and comprehensive outline of the construction and care of this power plant. In the foreword there occurs the following passage which is worth reproducing, for it points to the root of many difficulties in aircraft operation. "It has been our experience that 90 per cent of the troubles experienced with aeronautical engines have been from lack of acquaintance with the small but extremely important details which are different in different makes of engines. *** Do not blame the engine or accessories for troubles which can be avoided by proper care."

The detail specifications of the D12 engine, as contained in the Handbook, are given below.

Specifications of Curtiss D12 Engine

Rated horsepower	375 at 2000 r.p.m.
Type	45 water-cooled V direct drive
No. of cylinders	12
Length of motor	58¾ in.
Width of motor	26¾ in.
Height of motor	34¾ in.
Displacement of motor	1145 cu. in.
Bore	4.5 in.
Stroke	5 in.
Compression ratio	5.3 to 1
Piston displacement	95.4 cu. in.
Angle of cylinders	60 deg.
Brake horsepower at sea level at 2000 r.p.m.	400 hp.
Maximum r.p.m.	2200
Economical r.p.m.	1850
Ignition	High tension Splitdorf Mag. SS12 (dual)
Carburetors	two Stromberg NAY5
Max. oil temp. allowed	160 deg. F.
Normal oil temp.	140 deg. F.
Oil pressure desired	100 lb.
Grade of oil desired	Gulf 90 05
Average oil consumption	0.016 lb./b.hp./hr.
Max. water temp. allowed	180 deg. F.
Capacity of cylinder water jackets	44 lb.
Average fuel consumption full throttle	0.53 lb./b.hp./hr.
Average fuel consumption cruising	0.50 lb./b.hp./hr.
Speed of propeller crankshaft speed	
Speed of tachometer shaft, one half crankshaft speed	
Weight of motor complete with prop hub and water	724 lb.
Weight of motor empty and without accessories	680 lb.

Cost Accounting in Aerial Transportation

By EARL D. OSBORN

Formerly of the Aeromarine Airways, Inc., New York

The most perfect system of cost accounting consecutively carried through will give misleading results if the industry to which it is applied is unstable. Nobody has yet claimed that air transportation has gone beyond that stage. Though the art of showing the different elements of cost has reached an almost scientific stage of perfection, yet the system chosen for a given industry and its application must be the result of long experience. This only time can perfect. Aerial transportation has not been operating for a sufficiently long and consecutive period to develop a perfected special system, but even in perfect results can show how an air line can be operated more efficiently. These results are essential to the setting of rates and should be of interest to financial backers of an air line.

The Accountant's Problem

The problem of the accountant is so to group the elements of expense that the directors may have a clear mental picture of the cost. This will enable them to use their judgment as to the relative value of expenses and to expend their efforts where they will produce the most results. This grouping or segregation of expenses is of primary importance, for once a system is adopted it can not be changed without injury to both comparative and cumulative results.

It would seem natural to divide the cost into two main groups, namely expenses incurred while flying, such as gasoline; and fixed charges, such as rent. Among the former or operating charges are fuel, maintenance, depreciation and accident; among the latter are pilots salaries and expenses, managerial salaries, general expenses and insurance. Such a grouping will in a general way show whether or not the fixed charges are out of proportion to the operating or flying expenses.

Taking up the operating charges first, the fuel account is divided into gasoline and oil. If the organization is small enough that the management can keep in mind the amount of gasoline in the storage tanks and can quickly spot any leakage, the account is not difficult to keep. However, as the organization grows, it will be necessary to keep an office record of gas in storage and gas given to each ship. This complicates the records and necessitates a storekeeper, who alone should have authority to issue fuel. Pilots and mechanics should not be expected to turn in consistent reports, for they have other things to think about.

What Maintenance Consists of

The Maintenance ledger account is the most complicated and interesting of all. It naturally divides itself into Motor maintenance, Rigging, that is, wings and controls; Fuselage or Hull for flying boats, and a General Maintenance charge for such items as cleaning, hauling around field, etc. The maintenance of auxiliary equipment can either be included here or made into a separate account. All these accounts have to be divided into Labor and Material.

It should be remembered that it is better to adopt a simple system and carry it through consistently than to adopt a complicated system which, though giving more detailed results, is difficult to carry through. Attention should also be paid to the fact that maintenance cost figures cannot be obtained during one month's operation but only after a long period during which a ship will have approached the limit of its useful life. Thus, with luck a ship will run 100 hr. with little maintenance, then the motor will have to be overhauled, although the wings and hull may go to 300 hr. or even more without heavy repairs, which will depend on the kind of plane used and especially on how it is treated.

It is possible to create a reserve for maintenance, charging a ship a certain amount for each hour flown and deducting from this account the amount spent for maintenance. This may be very useful to the manager in figuring what a month has really cost him, but as the figures are a theoretical assumption they should be put in parenthesis and only the actual figures entered on the books. Again, when a new motor is put into a ship the old motor goes into stores and it may be months before the old motor is overhauled and the cost ascertained. Here again it is possible to make a theoretical estimate of the cost of overhaul and make the proper adjustment when the motor is finally overhauled, but it is really better to wait until the work has been done before making the charge.

Maintenance is of three kinds: running maintenance, when the ship is in operation; overhaul maintenance, when the ship is put out of commission for serious repairs, and maintenance due to accident. These subdivisions are of interest and importance, especially the accident item, for they permit of making interesting comparisons between different types of ships, though they require a vast amount of work and lead to confusion unless the accountant has plenty of time. A separate cost record for each ship is well worth while, but the accountant must be sure that he has the time and knowledge to carry through such a system, for unless he does he will have spent a lot of time and get confused results.

Details of the System

Maintenance may farther be subdivided into a great number of jobs each with a code number. Thus Motor maintenance would include Motor Removal, Disassembly, Grinding valves, Fitting bearings, etc.; under Hull would be Building new steps, Interior cabin work, Exterior upper hull work etc. Rigging would comprise Wires and Fittings, Control wires, Cutting and sewing new fabric, Patching, etc.

There are a limited number of things that can be done to repair a plane, and once the divisions are coded by using a code there is no great difficulty in applying this system. Its advantages are that it enables the manager to see with great detail where his maintenance money is being spent. For instance, on Motor maintenance it may be found that valve grinding is very expensive. The manager, therefore, will devise new methods to reduce the cost. Or again, it may be found that certain men take twice as long as others to finish a job. After a job has been done several times it is pretty easy to tell what it is going to cost in the future, which is a great help in estimating the cost of an overhaul. The cumulative results afford a scientific basis for the reduction of maintenance on a new ship.

It is well to attach to the cost book a description of each job done so that the manager may more readily connect it with the work done. Each subdivision or code number must have a column for the number of hours, the cost and the material used.

If the time cards are badly made out the accountant's efforts are entirely wasted. Time cards must be made out daily, checked by the shop foreman, and the accountant himself will pretty well know what is going on. This produces a continuous struggle and requires the full hearted cooperation of the manager, but it is a point that cannot be neglected. The material in stores is also a matter of great practical difficulty for the store room must be locked and material only issued on written requisition. When a mechanic is in a hurry he objects to this. Each major part must be numbered and its inventory kept of all parts. The system is the same as in any other line of business, but it requires a storekeeper, time and cooperation to get good results and all of these are hard to get.

Depreciation Account

The Depreciation account is the hardest to work out practically. The best scheme is to figure out how many years it will be possible to use the equipment and then to depreciate on a monthly basis. If the assumption is wrong it can be revised later, but depreciation is such an important item that it must be entered on the books monthly. On my trip abroad I found depreciation rather underestimated, some claiming that a ship would crash before it reached its full life, while others maintained that by proper maintenance and replacement the life of a ship was almost indefinite. Judging by American experience, even where ships have been operated up to 600 hr., it seems difficult to determine a basis for depreciation, chiefly because it depends too much on the way a ship is used and maintained. There is really no empirical rule in this matter.

Life of Engines

The life of the motor depends entirely on the amount of flying done. The reliable life of a Liberty motor is around 400 hr. but the writer has heard of motors doing 600 and 700 hr. The skill of the maintenance and repair force plays a very large part in the life of a motor, and so does the speed at which the motor is run. Some claim that by proper replacements the life of a motor can be prolonged indefinitely, but one cannot tell what to replace until breakages occur and a commercial line can not afford breakages.

Especially with seaplanes, which are out of the hangar a large part of the time, the mere lapse of time plays a large part. I should say that at least 50 per cent of depreciation should be charged not to flying but to exposure to the weather. Even a machine kept in storage under perfect conditions depreciates sensibly. The military estimate that a wooden machine would not be serviceable after six years of storage. In addition we have the obsoletion factor, so that theoretically we cannot depreciate on flying hours alone unless aircraft are used very intensively, as has been done abroad in certain cases. The normal life of a machine is about 600 hr. after which the safety factor diminishes greatly, or rather erratically, and the cost of maintenance increases by leaps and bounds. Certain European air lines, however, have run their machines over 1000 hr. in a little over a year's operation. The Aeromarine Airways for a while used a combination of the two elements of time and flying, allowing a maximum for both; that is, 1000 hr. for flying, and seven years for time. The depreciation was done monthly, using the last month's depreciated figures as the basis to start from. This gave a rapid depreciation at first, but it gradually lessened, which holds true from the viewpoint of possible sales value of a machine and counterbalances the maintenance which starts low and gradually increases.

Ships Always Depreciate

This also brings to the mind of the management the fact that the machines are depreciating whether they are in operation or not. Theoretically, some such system seems correct, but in practice if machines are used intensively it is better to depreciate them on a flying hour basis, while if they are used spasmodically the monthly basis should be used.

The Accident account, from a bookkeeping point of view, is simple. It includes the destruction of material, cost of salvage, damages paid out and, if the maintenance system permits it, also the cost of repairs. From the viewpoint of cost it is impossible to give figures except after a long number of years. The account is of importance as checking up against insurance costs. The Accident account of the Aeromarine Airways was considerably less than the premiums paid, though more than the compensation received. The Accident account cannot contain intangibles such as loss of business due to a crash.

Fixed Charges

Turning now to Fixed Charges, it is claimed by some that Pilot's Salaries should be divided between flying and maintenance. From personal experience it appears that when pilots are not flying their time is ineffectually employed and the cost of maintenance work done by them is excessive. There are, of course, exceptions to this rule. The expense accounts are generally an important item, amounting at times to more than the salaries.

The managers' and officers' salaries are probably worthy of a special account with a subdivision for expenses.

The Sales account should contain subdivisions for salaries of traffic men, for commissions, for advertising and for expense accounts. The latter can be divided into meals, hotels, taxis, telephones, carfare and railroads. Though not necessary, such a division is useful in checking and keeping down expenses.

The General Expense account may be subdivided into office salaries, office supplies, miscellaneous expense accounts (telephone and telegraph, and in the case of seaplanes including boat hire) rent for office and shop and miscellaneous expenses.

The insurance charges are handled in the ordinary manner.

In the above there have been omitted the interest and dividend charges, for these will be found described in detail in any financial prospectus and do not require special mention.

There are a number of accounts such as Capital, Equipment and Stores which do not enter into cost figures but which show on the trial balance. Equipment should be divided into Flying equipment and Tools and Fixtures such as hangars, motor boats, etc. The inventory can best be kept on cards which show the original cost and the expense of maintenance and improvements. A separate account can be kept for maintenance of equipment other than flying equipment, but it is simpler to make it a subdivision of the Maintenance account. The fewer the ledger accounts, the better it is for all concerned.

Miscellaneous Accounts

There will probably be a number of accounts which the accountant will want to open. For example an air line may operate South in the winter and North in the summer. The cost of this transfer could be entered in an account called Base Transfer, with the same subdivision as the regular cost records, but showing the expense of moving in one lump sum. This would show the cost of such a system of operating very strikingly. At the same time, in making up the cost figures, it would be possible to shift back to the normal ledger accounts to show the flying hour cost.

The following example of bookkeeping techne may be of interest. The Aeromarine Airways used three forms. First, a Cash Receipt which gave the ticket numbers or a notation on the source of the receipt and which was posted to the Cash book, an Accounts Payable Voucher was used for the payment of bills, for cash advances to individuals, for undistributed pay, etc. which being cash transactions were entered in the cash book. All the costs were posted from the Journal Vouchers on which for example the amount of a given bill would be credited to Account payable and Sales (subdivision advertising) debited if the bill were for advertising, or Undistributed Payroll would be credited and the distribution thereof debited to Maintenance, Pilots' Salaries or whatever the case might be. These Journal Vouchers were entered in a register which contained columns for all the Ledger accounts. These columns would be totalized monthly and entered in the ledger as would the totals of the cash book. This system enables one to localize the mistakes more easily.

Cost Records

The cost records were at first kept in a large many columned loose leafed book to which were posted all the Journal Vouchers affecting cost. Later, as the management demanded more detail, a card system using code numbers was adopted. Notation was made on each Journal Voucher of what ship or what base the charge applied to and it was entered in the appropriate place. The total of all the ships and all the bases gave the total as shown in the Ledger. Keeping a record of the cost of each base is necessary, showing the cost of each ship is interesting, and if one ship is used more than another or under different conditions it is well worth while knowing. This entails a little more work and to be of value it must be carried through continuously. Spasmodic cost accounting is useless.

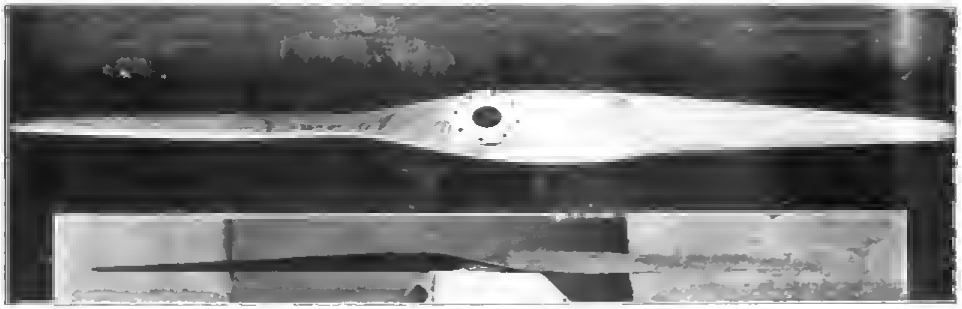
There is grave danger that an accountant may get lost in a maze of bookkeeping detail and that he will make no use of the figures he has so laboriously obtained. It sounds foolish, but the writer has worked for days to spot a discrepancy of a few cents between ledger and cost accounts and having spotted it gone on to the next month's figures without drawing any conclusions or getting any cost figures relative to flying hours. The flying hours done by each ship and the number of passengers carried should be entered in the ledger monthly. It is as much a part of the records as cash taken in. The accountant should always bear in mind the manager's viewpoint, and study to find what figures are intelligible to him and devise figures which give him new ideas. The main thing that a manager wants to know is the cost of the flying hour

or flying mile. As was said before, these figures for any given month may be misleading, but comparisons between months are interesting and instructive. The accountant should show the relation between flying and fixed costs, the average number of hours flown by the ships per day, the average passenger and freight loading, the hours each pilot flies. He should also bring out the expense accounts of personnel if they are abnormal. These figures should be made up monthly and pictured graphically. Though at times there will be such variations as to make the figures seem unreliable, in the long run he will get comparisons that are of great value.

The manager on his hand should back the accountant in getting cooperation from the shop force and correct information on flying time. He should not assign the accountant to all sorts of other work and still expect him to get results, nor expect to get accurate figures in a month's time. But he should be the judge of whether the information given by the accountant is practical. He should also realize that certain accounts, such as Depreciation, are just as important as actual cash expenditures. If the manager of an air line does these things he will build up a very valuable source of information as to the condition of his business.

Description of the Curtiss Reed Metal Propeller

The Curtiss-Reed metal propeller, with which the winning planes of the 1923 Pulitzer Trophy and Schneider Trophy races were equipped, is quite novel in its plan and construction. It is made from a single plate 1½ in. or less of forged duralumin, tapered in thickness toward the tips, machined or formed to airfoil sections, then twisted to pitch and mounted with aluminum filler bosses fitting the central twisted surfaces on the same steel hub which is used for wooden propellers, and therefore is interchangeable with the latter. The diameter is about the same as that of a wooden propeller built for the same service, and the weight is the same or slightly greater. The propeller is semi-flexible, that is, rigid at center and resiliently flexible towards the tips, so that centrifugal force is mainly counteracting deflection.



Two views of the Curtiss-Reed duralumin propeller, with which the winning planes of the 1923 Pulitzer Trophy, Schneider Cup and On-to-St. Louis races were equipped

This propeller was the result of several years careful experiments with models by S. Albert Reed, an engineer who, in his earlier career, had specialized on research work in physical science, and after retiring from active professional engineering work resumed his researches in his own laboratory. His purpose was the design of a blade which could be moved through the air at super-speed, namely, above 900 ft. per second, with minimum of wasteful resistance. After reaching over 1500 ft. per second without any break in the continuity of the plotted curve of thrust and speed, Mr. Reed designed and constructed the first full-size duralumin propeller with knife-like blades, which propeller flew successfully on its first trial, Aug. 30, 1921, on a Curtiss "Standard" Plane with 160 hp. engine and made better speed than the wooden propeller which it replaced. The same propellar was in December, 1921, tested successfully to 50 per cent overload for 30 hr. at McCook Field and is still in flying service.

Mr. Reed then proceeded to design and make propellers for try-outs on most of the typical planes and powers, obtaining invariably an improvement in speed. The superior efficiency of his type of propeller was further established by tests of 3 ft. model by the N.A.C.A. at Stanford University by Dr. Durand, who reported the highest efficiency ever obtained for the same pitch ratio.

In the Spring of 1923 the Curtiss Aeroplane & Motor Co., Inc. took a contract to further develop and manufacture the Reed propeller in the United States, and proceeded to equip all its 1923 special planes with this propeller, namely, the Navy-Curtiss seaplane racers for the Schneider Cup, the Navy-Curtiss racers for the Pulitzer Trophy, the Army Curtiss Pursuit Plane and the Curtiss Night Mail plane. The results were entirely successful, as the performances of the above named ships have shown. In addition, two of the three Army-Racers at St. Louis were equipped at the last moment with rush-order Reed propellers, no time being obtained for adjustment to the best efficiency.

Therefore, at the St. Louis races four of these propellers were on Pulitzer Trophy contestants, one was also on the winner of the "On to St. Louis" race (900 miles), and one on the Army-Curtiss pursuit plane which gave several brilliant exhibition flights over the audience at the races.

The Curtiss-Reed propeller was on the winner and second of the Schneider Cup as well as of the Pulitzer Trophy and it is generally conceded that this propeller contributed materially to the record speed of the winners.

While Mr. Reed's object was the design of a propeller of increased efficiency, and especially of one which could be run at higher engine speeds without gearing, he appears incidentally to have obtained a successful solution of the metal propeller problem too. As this propeller is a single piece of metal without connections, welds, rivets, or hollow spaces, it seems almost the last word in the direction of simplicity.

Several Curtiss-Reed propellers have already records of from 5000 to 10,000 mi. of flight without changing form, yet the pitch can be changed in the shop in a couple of hours at least 20 per cent higher or lower without detriment.

The French and British governments have recently completed tests of Curtiss-Reed propellers and arrangements are being made for their introduction abroad.

U. S. Navy to Participate in Amundsen Polar Flight

Amundsen Will Take Three Flying Boats into Arctic Ocean To Reconnoiter Unexplored Territory

The United States Navy will be represented in an expedition which will attempt a flight by seaplane over the North Pole under the leadership of Capt. Roald Amundsen next summer. Arrangements have been just completed with the Navy Department for Lieut. Ralph E. Davison, U.S.N., to take part in the expedition and to command one of the three seaplanes which will make the polar flight.

The request that an American naval aviator take part in the expedition was made a few days ago by H. H. Hammer, representative of Captain Amundsen in this country. Details of the plan for the expedition were laid before Secretary of the Navy Denby who approved of participation by a naval pilot. Lieutenant Davison was selected from over thirty U. S. naval aviators who volunteered for the expedition.

Lieut. Ralph E. Davison, U.S.N., who will pilot one of Amundsen's planes in the Polar Flight Expedition

The expedition will be transported to Spitzbergen on shipboard at the end of May, 1924, where a base of operations is to be established.

A non-stop flight over the Arctic regions is not contemplated, the distance from Spitzbergen to Alaska is about 4000 mi. In the early summer the airplanes will be carried by ship to the edge of the ice pack which will probably be about 450 mi. from the North Pole. From here flights will be made to the Pole, where a depot of supplies of food and fuel will be established. The planes which will be used are former "Dolphin" flying boats especially constructed to take off and land on ice or snow or on the water. They will be equipped with radio sending and receiving sets and will thus be able to keep in communication with the depot ship. By means of a high power radio installation the depot ship will radio to the world the progress of the expedition.

The squadron of three planes will be manned by six men. Captain Amundsen will command one of the planes, Lieutenant Davison will command another and the third will be under the command of a pilot who remains to be selected.

The desire of Amundsen to have an American naval officer take part in the expedition is an echo of the firm friendship which existed between Rear-Admiral Peary, the discoverer of the North Pole, and the noted Norwegian explorer who discovered the South Pole. This was one of the reasons for his offer of a command of one of the planes to the Navy Department.

Another reason of a more practical nature were the requirements for such an effort. The Arctic explorer by air must develop a versatility that is not common. He must have a thorough knowledge of the principles of navigation, be an expert pilot of seaplanes and landplanes, be well grounded in a knowledge of radio communication and be of robust physique.

There are over 1,000 000 sq. mi. of unexplored territory in the Arctic regions betwen the North Pole and Alaska, and as much as possible of this area will be explored by the party. An attempt will be made to discover whether or not the theory now held by some scientists that a large continent exists in this region is correct. Other valuable scientific data and information of practical value will be obtained. The feasibility of trans-Polar air routes for aircraft which would link the East and West in air lines over the shortest routes between Northern Europe and the Pacific will also be investigated.

Interesting Navigation Problems

The navigation on such a flight will be of the greatest interest from a naval standpoint. In a region where the magnetic compass is practically useless it will be necessary to lay all courses by the sun and this will be possible on account of the twenty-four hours of daylight. One disadvantage to be had from continuous daylight is anticipated in radio communication. It is well known that greater distances can be bridged by radio at night. The development of the bubble sextant which is used in the United States Navy for navigation of aircraft will in all probability prove a boon to the explorers. This instrument eliminates the necessity for a horizon in making observations of the heavenly bodies. It will probably supplant the artificial or mercurial horizon hitherto used on expeditions in the arctic.

A thorough reconnaissance of flying conditions in the polar regions was made by the Hammer-Junkers expedition which made flights north of Spitzbergen during the past summer. It found that landings could be effected in numerous places on the ice, snow or water in the region of the pack ice.

The Amundsen expedition will not attempt the trans-polar flight to Alaska until several flights have been made in the vicinity of the North Pole where conditions will be studied and bases established. The final effort will consist in a flight from Spitzbergen to Alaska across the Pole, to the vicinity of Point Barrow.

The S.S. Maud which is now frozen in and has been drifting with the ice pack for two years may establish a contact with the planes. When the flight to Alaska is in progress the Maud will send out sledge parties from the ship in an effort to intercept the line of flight. A small plane is also carried on the Maud which can make reconnaissance flights at some distance from the ship.

Lieutenant Davison, who has been selected from the many volunteers for the expedition, is a native of Missouri. He graduated from the Naval Academy in 1916 and during the war performed duty in the Atlantic Fleet on battleships and destroyers. While a student at the Naval Academy, Lieutenant Davison was awarded a prize for excellence in practical and theoretical navigation. He also holds pilots and masters licenses for all classes of merchant vessels. He entered the training school for naval aviators at Pensacola, Fla. in 1919 and was subsequently detailed to torpedo plane development work at Hampton Roads, Va. For the past two years he has been stationed at the Naval Air Station at Pensacola, where he is at present on duty. It is expected that he will leave this country early in March of the coming year to join the expedition while it is fitting out in Norway.

AIRPORTS AND AIRWAYS

Chicago News

By Otto Klein

Saturday, Nov. 3, the day of the big Chicago-Illinois football game at Champaign, Ill., proved another great disappointment for Chicago fliers who have been blessed with rain and wind every time something special was to take place during the last summer. Arrangements had been made for a number of planes to fly over the new university stadium during the game, some bearing paid advertisements; others advertisements boosting Governor Small, through whom it is hoped a landing field will be obtained in Lincoln Park.

Nimmo Black left with a news photographer Friday afternoon, the weather being clear and crisp. Saturday morning, however, after three weeks of beautiful fall weather a dense fog greeted the other fliers. Nevertheless, the Heath "Favorite" left Black's field at 11 a. m. with two passengers, intending to plow through the fog to the city limits, where the fog was thought to clear away. The ship circled the field once, then went immediately out of sight. John Huber's Canuck and the Heath company's Standard, carrying E. B. Heath and the AVIATION correspondent left simultaneously at 1 p. m. Dr. Fergusson's "Hisso" Standard and Henry Etton's ship, which were to accompany the other ships, however did not leave on account of the fog.

The Heath Standard had hardly gone a mile when the fog changed to a blanket of thick black smudge, extending up to 1,000 ft., forcing the pilot to fly over the populated part of the city at 400 ft. in order to see just one square block below. After about fifteen minutes he was able to climb to 1,000 ft. and see almost a mile all around. At this altitude the ship passed Checkerboard Field and later Ashburn Field, climbing right along until it reached Harvey on the Illinois Central R. R. From here it followed the I. C. tracks to Chanute Field, mostly at 1,500 ft.

On the way a large silver colored ship was met, evidently bringing pictures to Chicago. Near Chanute field the Heath "Favorite" was passed on its way back to Chicago. About ten miles from Champaign solid white clouds came rolling across the course so low that the pilot immediately dropped to 100 ft., yet barely seeing the railroad tracks below. It was utterly impossible to go on, so the pilot turned back, landed at Chanute field and returned to Chicago the following day in a drizzling rain with the night falling and ten minutes of gas left. John Huber, who was also forced to turn back and take refuge at Chanute Field, and who returned with us, arrived a few minutes later, having taken a different course over the city.

At Chanute Field there was Nimmo Black's ship at the "visiting" hangar, also a Bréguet from Monmouth, Ill. Black was developing pictures of the game, taken before the fog thickened. He did not leave until the following day, having forwarded the pictures by rail the night before.

The new ship of Elmer Partridge's is not a thick wing monoplane, as was erroneously stated before, but a biplane. Partridge intended to make it a monoplane, but he later changed his plans.

Mrs. Bert Metzger and Henry C. Etton flew to Grand Rapids, Mich., last week in Mr. Etton's new Oriole. They made the trip of 200 mi. in 2 hr., had lunch in Grand Rapids and returned to Chicago the same day.

Paul Milnor, who was killed in an auto accident in Iowa the end of last month, was laid to rest at Mount Hope Cemetery, Chicago, Saturday, Nov. 3. Milnor was one of our crack fliers and was given a last escort by two airplanes piloted by George Weaver and Harry Keller, who dropped flowers over the grave during the ceremony.

Monday night's meeting, Nov. 5, of the local members of the National Aeronautic Association proved one of the most interesting. Capt. C. P. Fatcher, chaplain at Chanute Field, came as a guest of Terence Vincent and spoke of the work of the Air Service, dealing in particular with the remarkable progress made in aerial photography and the wonderful equipment along this line at Dayton and Rantoul.

Dr. Dill Robertson, former Chicago health chief and president of the school board, and Mr. Shelton, director of registration, also attended the meeting and in the course of their conversation mentioned that the state had some forty normal schools and 700 high schools which have large athletic fields, big enough to be used as flying fields. Mr. Shelton thought that the governor would be glad to offer these fields for the use of emergency fields, which would give the state of Illinois 740 additional marked flying fields.

Michael Rahner cited an instance where the present administration, instead of helping aviation along, had planted a row of trees across Checkerboard Field, which makes it practically impossible for the average low powered ship to use the field in safety.

Attorney McCracken related his talk with President Patterson of the National Cash Register Co. It would be too lengthy to mention all the good things that Mr. Patterson is doing in behalf of he N. A. A. and aviation in general, but it is certain that if other prominent men would give half the energy in behalf of the industry, aviation in the United States would soon come to the fore.

Saved from Rabies by a Plane

Ino E. Crowell, who conducts a general airplane and supply business at Myers Park flying field, Matthews, N. C., together with passenger and exhibition flights, aerial advertising and flight training, recently gave a good demonstration of the practical uses of the airplane.

A farmer boy who had been bitten by a mad dog was found by a bacteriologist to show symptoms of rabies. The supply of Pasteur treatment being exhausted at the local health office, a shipment was ordered from Raleigh, N. C., but no Pasteur treatment was on hand there either, so a rush order was placed at Philadelphia. For some reason the shipment was delayed, and the eighth day approached after the youth had been bitten, that is, the practical limit for effective treatment. Learning of this situation, Pilot Crowell volunteered to get the badly needed treatment by air from the health authorities of South Carolina. Hopping off at 3 p. m., Oct. 2, in his Curtiss plane, headed for Columbia, S. C. By dusk he was back in Matthews with the treatment, which was promptly administered to the youth by a doctor.

Air Traffic Violator Arrested

After chasing Pilot Howard Calvert and his passenger, Frank O'Neill, prominent Akron clubman, through the skies in an airplane over Akron, Nov. 2, Harold Kallberg, volunteer aerial policeman and former World War ace, made what is believed to be the first arrest of a violator of air traffic rules in this country.

Calvert and O'Neill were arrested after they landed at Stow Aviation Field. They were charged with stunt flying over the city in violation of an ordnance. Arraigned in Municipal Court, both entered pleas of not guilty and were released on their personal bonds pending their hearing the next day.

O'Neill, charged with dropping handbills from the air, also in violation of a city law, declares he will make a test of the validity of the ordnance. Kallberg used his own machine in the flight.

A Canadian Fatality

Three fliers were killed near Roberval, P. Q., Sept. 26 when a seaplane used for surveying and forest protection plunged 2,500 ft. into Lake St. John. The dead are Bernard De Salaberry, pilot, Ottawa; Alphonse Landry, observer, Kamouraska, and Emile Deguise, surveyor, Chicoutimi.

Akron News

Plans to make Akron an international air center were outlined Nov. 7 before a gathering of 000 Akron club men in the Hotel Portage by Maj. Gen. Mason M. Patrick, Chief of Army Air Service, and P. W. Litchfield, first vice president of the Goodyear Tire and Rubber Co., who is president of the Akron chapter of the N.A.A.

General Patrick first announced that the Army Air Service plans for the world-circling flying expedition to be undertaken next spring were progressing satisfactorily.

"We have recently purchased from a California company planes capable of making 2,000 mi. flights without refueling," he stated. "The start will be made from the eastern coast, thence west to the Pacific. By using islands in the Pacific, the planes will eventually reach Japan then China, continuing their flights to Scandinavia, then Greenland and back to the American mainland. The longest over water flight on the trip will be 1,000 mi."

The General then spoke of the possibility of making Akron an international aircraft center. He said the automobile owed its success to the vast amount of money that has been put into it. And that this is what is needed in the aviation field to popularize it.

"The airship is the safest way in which man can travel. The Army Air Service has been conducting daily trips during the past six months without having a serious accident.

In speaking of the National Aeronautical Association Patrick said:

"This association was formed only a year ago and has stood its first and most trying year in a fashion that points to a decided success in the years to come. It should be national in name as well as work and strive to educate the people to the extent where air travel would be so safe that insurance would be possible."

Mr. Litchfield then told of the completed plans of his company toward the starting of active work upon the building of rigid airships, as outlined in the last issue of AVIATION.

In the afternoon General Patrick accompanied by a guard of honor attended the giant mass meeting of several thousand high school and junior high school pupils in the armory at which time Wm. B. Stout, Detroit airplane manufacturer, inaugurated a contest between Detroit and Akron boys in the building and flying of airplanes.

St. Louis News

By Manuel Hahn

A burst of sunshiny Indian Summer weather has given renewed impetus to the activities at the Lambert-St. Louis Airport. The new ship of the Flying Club of St. Louis was christened with a bottle of near-beer last Sunday, and has been kept in the air regularly since.

The control of the flying field has been leased to the Flying Club of St. Louis by the St. Louis Aeronautic Corp., owners. Under the terms of the lease, continued construction work will be carried out, and rules for the protection of new work will be issued and broadcasted so that new fills will not be scarred and ruined by visiting and local planes.

Under the rules of the Flying Club, hangar space in the four hangars will be leased to all applicants as long as space exists at a very reasonable charge of $5.00 per month per ship during the winter and $8.00 a month during the flying season has been set. High grade gas and airplane oils are obtainable at the field, and a complete machine shop is also located in the back of the hangars.

In addition, the Flying Club has retained the services of Frank H. Carlson of the Robertson Aircraft Corp. for actual care and control of the field. Lieutenant Robertson is an experienced aviator and is well qualified for his new duties.

The Robertson Aircraft Corp. reports two sales of planes in the past month. It appears that the result of the International Air Meet will be a rush to the air, for applications for training in the coming spring season are pouring in.

The 110th Observation Squadron, Missouri National Guard, by arrangement with the Robertson Aircraft Corporation now have the use of a Jenny for training and observation flights. Delivery of the government planes cannot be made before next year, but in the meantime, flying is going on daily, and the weekly drill has developed into a rigging school.

The Flying Club of St. Louis, at its last regular meeting, voted to sponsor an organization of boys for the purpose of building model airplanes and flying them. A series of races is planned for the winter. The need of such an organization is manifest by the superiority of the Chicago entrants in the Mulvihill Trophy Contest at the International Air Races, and every effort will be made to lift St. Louis model builders to the highest standard. All members of the Junior Flying League of St. Louis will be asked to join.

Progress of French Commercial Aviation

Official figures on the operations of French airways, recently made public, show a very satisfactory growth of air travel in Europe.

Figures compiled for the year 1922 show that commercial planes plying to and from France accomplished 9,236 voyages, totaling 2,200,400 mi., and had carried 14,937 passengers, 1,165,375 lb. of freight, and 90,000 lb. of mail. This was accomplished in the main by French companies.

The first six months of 1923 make a still better showing. The total traffic in French territory represented voyages totaling 1,127,700 mi., the planes having carried 6,858 passengers, 854,125 lb. of freight and 73,650 lb. of mail.

The actual routes in operation are, in the north of France, Paris-London and Paris-Brussels. To the east Paris-Strassbourg, Prague-Warsaw and Prague-Budapest-Belgrade, the last section of this latter journey, Belgrade-Bucharest-Constantinople, being planned to be put into operation on a regular schedule in 1924. It necessitates night travel, but experiments have so far proved very successful.

In the south the principal line is the France-Morocco one. It starts at Toulouse with terminus at Casablanca. From the latter place a branch line leads to Oran, Algeria. In addition a seaplane service is operating across the Mediterranean, from Antibes to Tunis, and this will be linked up next year with Marseilles as will the Morocco service.

Last July the Marseilles-Algiers line, via Barcelona and Palma, was inaugurated. The importance of this service is manifest when it is considered that it brings Marseilles within 10 hr. of Algiers, as against 30 hr. by ship, considerably facilitating France's relations with that colony.

Future plans include the prolongation of the Toulouse-Casablanca line to Dakar.

Flying Boats End Season

The commercial flying boats Balboa and Niax of the Aeromarine Airways, Inc., have returned to Keyport, N. J., from Detroit, where they were in passenger service throughout the summer.

C. F. Redden, president of the company, said it was the fourth round trip the planes had made between Florida, where they operate in winter, and Detroit. He said that his fleet had just completed its second Detroit-Cleveland service, serving more than 5,000 passengers in that time without accident.

Plans for the winter season have not yet been announced. In the meantime, the flying boats, some of which have seen four years of service, are being overhauled in the Aeromarine plant at Keyport.

New Interests in Curtiss Co.

C. M. Keys, President of the Curtiss Aeroplane and Motor Co., has announced that he has sold a substantial stock interest in the company to Leonard Kennedy and Co., whose offices are at 67 Wall St., New York. Mr. Kennedy and his associates were in charge of the reorganization of the Goodyear Tire and Rubber Co. of Akron. It is not expected that the purchase of the Zeppelin rights by the Goodyear Co. will lead to any merger of these interests.

All those interested in the new arrangement state that there will be no changes in the policy or personnel of the Curtiss organization, as Mr. Keys will continue actively to direct the operations of the company.

French Aircraft Exports

Imports of airplanes into France in six months of 1923 amounted to 96,000 francs in value, whereas the exports in the same period amounted to 11,142,000 francs as compared with 7,128,000 francs in the corresponding period of 1922.

After Alabama, Utah

Last week it was our pleasure to record the progressive spirit shown by the Governor of Alabama when he urged the municipalities and civic organizations of his state to create landing facilities for aircraft

It is gratifying to report now that Alabama's example was quickly followed by Utah, whose Governor, Charles R Mabey, has issued the following proclamation:

"The tremendous progress in the science of aviation has commanded the notice and interest of the entire civilized world

"Having proved a most formidable and effective weapon in war, aircraft is now rapidly being adapted to peace-time uses. Its remarkable commercial and industrial utility, in addition to its value as a vehicle of transportation, portend enormous development and great success in aerial traffic. The occasional aerial tourists who now traverse our state are merely forerunners of great numbers of such travelers and the harbingers of extensive air service traversing thousands of miles which are certain to materialize

"The development of aerial traffic thus far devolves certain duties and obligations upon the state, county and municipality as well as upon the federal government.

"Principal among these is the provision for adequate landing facilities. Lack of suitable alighting ways is doubtlessly the greatest single drawback to the successful advancement of air traffic. Furthermore, one of the greatest sources of hazards to aviators is the absence of prepared airdromes, plainly marked so that they are discernable from the air

"Submitting that the communities of Utah will be eager to lead in the fillment of this obligation of progress

"*Now, Therefore, I, Charles R Mabey*, Governor of the State of Utah, in consideration of the premises and by virtue of the authority vested in me, by this instrument do appeal to the municipal officials and civic organizations of this state to effect the following:

1 Locate a terrain in proximity to their town or city which can be used and designated as a municipal landing field for aircraft. Such field should be smooth and dry of surface, reasonably level, unobstructed and in dimensions should not be less than 3000 ft square. There should be no wires, high trees, fences or other obstacles surrounding the landing place

2 Mark such field with a large white circle, of durable materials 100 ft in diameter, the band of which should not be less than 4 ft in width. Paint the name of the city or town on the roof of some prominent building, preferably the railroad station, if there is such, in large letters, which will be visible to a height of 3000 ft. in clear weather

3 Place a cloth cone, flag or instrument to indicate the wind direction at the edge of the field"

In commenting upon the Utah Proclamation, Col T A Baldwin, Jr, Air Officer for the 2nd Corps Area, Governors Island, New York City, states:

"Due to lack of funds, the War Department, for the present, is unable to land its assistance to municipalities endeavoring to establish airports and wdling to place their field under Federal control. It is hoped that future Congressional action will make available funds with which additional fields may be established at strategical points, but for the time being the War Department is unable to give favorable consideration to requests from any source for Federal aid of this nature."

Chas. H. Day Enters New Business

The Elektron Metals Corp of New York is to be congratulated on securing the services of Charles H. Day, widely known as a pioneer in American aviation and as a leading aeronautical engineer. Mr Day has been appointed sales engineer, with headquarters at the company's principal American office at 2 Rector St., New York.

Elektron metal is a German magnesium alloy which has a wide application for castings, tubes, sheets, etc., where maximum strength for minimum weight is a requisite. The specific gravity of Elektron is only 1 74 to 1.83. Its weight is approximately two thirds that of aluminum and its physical characteristics exceed that metal. It is understood that some interesting applications of Elektron metal to aircraft and aircraft engine construction are now being made.

New Air Navigation Charts

The first chart of land areas on the Mercartor projection to be used in air navigation was part of the equipment of the naval airship Shenandoah on her recent voyage to St Louis.

The chart included the states of New Jersey, Pennsylvania, and the northern parts of Maryland, Virginia, and West Virginia. It was prepared by the U S Hydrographic office for the use of the giant airship, but copies will be available for other navigators of the air

The chart was made from the topographic maps of the U S Geological Survey but with an important change.

The Geological Survey maps are on what is known as a polyconic projection, that is, they are drawn as if they were to be projected on the surface of a cone tapering northward toward the pole. Charts drawn on the Mercator projection are drawn as if to be projected on a cylinder.

Both of these projections are necessarily not quite accurate, since the surface of the earth is approximately that of a sphere and it is impossible in the nature of things to draw a perfectly accurate map of such a curved surface on a flat piece of paper like a chart

All maps are therefore drawn according to different projections, designed to minimize the error and to be most convenient for the purpose in hand. On a Mercator map the distance between parallels of longitude is always the same

Since on the sphere of the earth these parallels all meet at the poles, a Mercator map shows a great distortion of areas near the poles, which appear much larger than they are. In a polyconic map the parallels of longitude converge in the direction of the poles, although not exactly as they would on the surface of a sphere.

For purposes of navigation, however, the Mercator projection maps are superior since they permit the navigator to fix his latitude and longitude accurately by means of what are known as 'summer lines," worked out as a result of two observations of the sun with a brief interval between

The Hydrographic Office therefore devised a new method for the reduction of polyconic to Mercator projection maps, and the first result of it was the chart used by the Shenandoah. The chart shows lines of equal compass variation, contour lines, main highways, railroads, rivers and the built up part of cities and towns.

Sergt. James H. Waller Dies

James H Waller, one time Sergeant Major, Royal Air Force of Great Britain, died in New York, Nov 4, from after effects of the war in which he served with great distinction. He was buried with military honors at Astoria, L. I., as airplane flying overhead during the burial ceremonies. The British Great War Veterans and the Gordon Lodge, Sons of St. George, turned out in force to pay the famous flier a last tribute.

Seven years ago Waller, then a sergeant major and conqueror of the great German ace, Max Immelmann, was the hero of every "rookie" in the Royal Flying Corps. High ranking officers praised him as a man whose bravery in that feat must be recognized as an important factor in building up the morale of Allied aviation. He was decorated with the Distinguished Conduct Medal, the Russian Medal of St. George, first class, the Mons Star and the Military Medal.

Waller was a butler in a New York family when the war broke out. He immediately enlisted in the British Army, and was eventually transferred to the Royal Flying Corps, where he quickly achieved distinction. When the war was over Waller returned to his erstwhile employers in New York.

The gangrene of the stomach to which he succumbed was the direct result of his being gassed on the day in 1918 when he was shot down by five enemy Fokkers behind the German lines. Four months in a prison camp, where he was hated as were few other prisoners because of his victory over Immelmann, almost completed the work of the chlorine barrage which, by the irony of fate, was laid down, not by the Germans, but by the Americans.

Sergeant Major Waller had the satisfaction of knowing that three of the five Fokkers fell in flames before his own plane was crippled and that his machine killed three German machine-gunners in its final nose-dive. He was a modest hero, however, always blushing when his deeds were mentioned.

U. S. ARMY AND NAVY AIR FORCES

U. S. ARMY AIR SERVICE

Air Service Topics from Boston

Capt R Knight, who has been on duty with the Air Service Tactical School as Instructor for the last three years is now the Air Officer for the First Corps Area, relieving Capt E in B Lyon, who has been Air Officer for the last two years. Captain Lyon is taking this year's course in the Air Service Tactical School at Langley Field.

First Lieut R. C Moffat flew from Boston to St Louis as the representative of the First Corps Area Air Office at the Pulitzer Races. He made the trip in 12 hr flying time, without trouble. Lieutenant Moffat leaves Boston, where he has been on duty for the past four years as assistant air officer and instructor to the National Guard and Organized Reserves, for station at Selfridge Field with the First Pursuit Group.

First Lieut A E Jones, who has been on duty in the Office Chief of Air Service, Supply Division, for the past four years, has been ordered to Boston to take command of the Boston Airport and as instructor to the National Guard and Organized Reserves.

The Boston Airport, which is in Boston proper, invites all Air Service Officers while on cross country trips to visit it. The field is plenty large to accommodate all service types of ships and is easily distinguished from the air by landing "T's," 1500 ft. each direction, covered with cinders, which makes it good in all kinds of weather. A radiogram to the Corps Air Officer with reference to the weather will be promptly answered. Air Service enlisted personnel as well as all kinds of supplies are available at the field

He Did Not Know Kelly Field

Perhaps no flying field in the country is as generally known as Kelly Field, situated some seven miles from San Antonio, Tex. An Air Service officer who was not stationed at Kelly Field during one time or another in his military career is the exception rather than the rule.

Recently the multigraph operator on duty with the Air Service Advanced Flying School at Kelly Field received, in answer to his request for a catalogue, the following letter:

"We have your letter of the 7th in which you advise us that you just had two Multigraphs installed and desire a book of instructions and a catalogue of parts for same. In order that we may have you located here at the factory so that we will know under what branch office you are located, will you please write and advise as what county in Texas you are in. By doing so you will render us a great favor, as we cannot seem to locate Kelly Field, Texas on the map."

Air Service News Letter which reports this amusing incident believes that this letter is an excellent argument for the need of Air Service publicity. AVIATION, which has regretfully watched said publicity drop from its high state of efficiency of a few years ago down to the neighborhood of zero, cordially agrees with this view

Lighter-than-air Training

Organization of a new class for a course of instruction of ten months at the Air Service Balloon and Airship School at Scott Field Belleville, Ill., has been completed. The class includes seventeen officers and fourteen flying cadets. It leads to rating as airship pilot. Training of the class will start at once in observation and spherical balloons and airships and that training will continue until Nov. 5. The ground course then commences and continues until March 20, when flying will be resumed. Coincident with the flying course, the students will assemble an airship in the large hangar. The students also will be attached to an airship company having complete war-time equipment and go into the field for one week.

The school staff consists of Maj. John A Paegelow, acting commandant; Capt. Laurence F. Stone, assistant commandant; First Lieut. Arthur Thomas, in charge of flying; First Lieut. Anger H. Foster, in charge of the ground course, and First Lieut. J. T. Shively, acting secretary and commandant of cadets. The faculty, in addition to Captain Stone and Lieutenants Thomas, Foster and Shively, includes First Lieuts. Charles Clark, Frank McKee and A. W. Gray, and Messrs. Leo Stevens, Warwick, Boland and Meadowcraft.

Kelly Field

First Lieutenant Maughan reported for duty with the 10th School Group and was assigned to the 43rd School Squadron (Pursuit).

Second Lieutenant Lawton received orders transferring him to Ft. Adams, Narragansett Bay, R. I.

Lieutenant Jordan left on a short leave upon the completion of the Special Observation Course, prior to sailing to the Philippines.

First Lieut. Lothn A. Smith, who has been on detached service at Langley Field, assumed command of the 26th Attack Squadron, relieving Lieut. J. E. Dake, Jr.

First Lieut. C. McK. Robinson returned to duty with the squadron. He has been on Special Duty at Headquarters, 3rd Attack Group as Group Adjutant during Lieutenant Gaffney's period of detached service at Langley Field, Va.

Lieut. P. E. Skanse returned from Langley Field, Va., where he has been on detached service taking part in the bombing tests and training.

Brooks Field

The training of the present class is progressing very satisfactorily and every day sees more new solo men at the flying stages.

During the past month 4 officers and 11 cadets were released from flying instruction. At present there are 100 ships in the hangars, and on the line, of which 88 are in commission and 22 in storage or out of commission. There are now 29 dual instructors of which 20 are officers and 9 enlisted men holding reserve ratings.

During the past week cross-countries were made by the following members of this command: Lieutenants Taylor and Wimsatt to Fort Worth and return; Lieutenants Umstead and Woolsey to Muskogee and return, Sergeant Colby and mechanic to Fort Sill and return, and Sergeant Mitchell and mechanic to Gonzales and return.

Major McGrath, F A O R C., reported for flying training at his own expense. Major McGrath comes from Austin, Minn., and seems very much interested in flying.

Joint Board Studies Air Service Needs

A study of the needs of the Army and Naval Air Services is being made by the Joint Army and Navy Board, Secretary of War Weeks announced recently. The Board will consider all questions relating to both services and will probably recommend a building plan for a number of years. The report should be ready about Dec. 1, it was announced, and it is said that it will be made to the Secretaries of War and the Navy.

Appointments

The following named candidates have been appointed as Second Lieutenants in the Air Service, Regular Army, upon passing examinations June 23, 1923:

Sergt. Robert Coleman Ashley, A S., Kelly Field, Tex.; Corp. Robert Scales Clary, A S., Selfridge Field, Mich.; Flying Cadet Edgar Marvin Fogelsonger, A S., Brooks Field, Tex.; Tech. Sergt. Carl Brown McDaniel, A S., 60th Service Squadron, Kelly Field, Tex.

Army Orders

Sec. Lieut. Patton Wright Burns, A.S.O.R.C., relieved from active duty.

Sec. Lieut. James Turner Nolen, jr., A.S.O.R.C., from A.S. Primary Flying School, Brooks Field, Tex., to inactive status.

Leave of absence First Lieut Roland Biran, A.S., extended one month

Orders First Lieut. William Bryan Robertson and Sec. Lieut Edward Henry Holterman, A.S.O.R.C., Sept. 10, amended extending active duty tour to include Oct. 10

Orders Capt. Edward Laughlin, A.S., San Antonio Air Intermediate Depot to McCook Field, revoked

Orders Flying Cadet Otto Wienecke, A.S., Lawrenceville, Ill to Scott Field, Ill by air, amended confirming Flying Cadet Wienecke's journey by rail

Two months' leave of absence to First Lieut. Clarence F. Horton, A.S., effective Oct 15

Four months' leave of absence to First Lieut Edwin E Aldrin, A.S., effective expiration foreign service tour, permitting return to U.S. via Suez Canal

Three months' leave of absence to First Lieut. Edward H Guilford, A.S., effective on arrival in U.S.

One month's leave of absence to First Lieuts Asa J Etheridge and Joseph W Benson, A.S., effective Oct 15, terminating to enable Lieutenants Etheridge and Benson to sail for Hawaii about Nov 20

Orders Oct 3 Capt James D McIntyre, Ord Dept., amended directing Captain McIntyre to report to A.S. Primary Flying School, Brooks Field

Following named A.S. officers from Philippine Dept., effective completion present foreign service tour, to indicated stations: Capt. Roland W Wittman, Scott Field, Ill. and First Lieuts Frank M. Bartlett and George H Burgess to Kelly Field and Bolling Field, respectively

Sec Lieut William B Goddard, 3rd, A.S. from Kelly Field to Primary Flying School, Brooks Field

First Lieut George F Parris A.S., Walter Reed General Hospital, to Col Joseph H Ford, M.C., Pres., Army Retiring Board, Washington, for examination

First Lieut Robert S Worthington, A.S., from Fairfield Air Intermediate Depot, to San Francisco transport sailing New York City Dec 5, for temporary duty Ninth Corps Area, thence to A.S., Hawaiian Dept, Honolulu, transport sailing San Francisco April 8, 1924

Maj John D Reardan, A.S., to board of standardization of war contracts, vice Maj George E A Reinburg, A.S., relieved

Capt. Hawthorne C Gray, A.S., Kelly Field, to Balloon and Airship School, Scott Field, for instruction

First Lieut. Peter E. Skanse, A.S., Kelly Field, to A.S., Philippine Dept., Manila, transport sailing San Francisco Dec 6, following leave of absence one month and fifteen days from Oct. 19

Orders Sec Lieut Ernest S. Moon, A.S., Aberdeen Proving Ground and temporary duty Kelly Field to A.S., Philippine Dept by transport sailing San Francisco Dec 6, revoked

First Lieut Albert F Hebberd, A.S., Hawaiian Dept., from temporary duty Crissy Field to Balloon and Airship School, Scott Field, for training

First Lieut. Eugene H. Barksdale, A.S., Mitchel Field, to McCook Field, on expiration of leave of absence

Sec Lieut. Lew Myers Morton, A.S., Brooks Field, to Coast Artillery Corps, Fort Monroe, Va

Maj Arthur Lavalle Rochmond, A.S.O.R.C., of State Street Trust Co., 581 Boylston St., Boston, Mass., to active duty, Army War College, Washington, D.C., Jan. 30 to March 18, 1924, for instruction in military supply

First Lieut Edward L. Fernsten, A.S., leave of absence extended ten days.

Four months' leave to Capt. Roland W Wittman, A.S., on completion present foreign service tour, with permission to return via Suez Canal to U.S.

Sec Lieut Frederick Tuttle Manross, A.S., transferred to Cavalry Oct 22

First Lieut. James E. Troupe, Coast Arty Corps, Fort Winfield Scott, Calif., to A.S. Primary Flying School, Brooks Field, Tex., on Oct. 26

U. S. NAVAL AVIATION

8600 Mi. Flight Without Forced Landing

A flight of 8600 mi. without a forced landing and with the same engines used throughout is the record made by two Marine pilots in two DH4B landplanes. This flight is the fourth longest in the history of aviation. The two planes landed at the Naval Air Station at Anacostia, D.C. on Nov. 2 after having been from the Island of Haiti to Washington, to St. Louis, to San Francisco and back to Washington.

The men were Lieut F. O. Rogers and H. D. Palmer, U.S.M.C., with First Sgt. B. F. Belcher and Sgt. P. P. Olmsbeak as mechanics. They were attached to the Marine Observation Squadron Two at Port au Prince, Haiti and Marine Observation Squadron One at Santo Domingo City, D.R. The fliers left the island of Haiti on Sept. 20 and flew across the Caribbean by way of Cuba, reached the coast of the United States at Miami, Fla. They reached Washington on Sept. 23. From Washington they proceeded to St. Louis where they attended the International Air Races on Oct 4 and 6. From St Louis they flew to San Francisco, going by way of El Paso, Tex. and San Diego, Calif. They arrived at San Francisco on Oct 15, and were present at the American Legion Convention. They flew east across the United States by way of Salt Lake City and St Louis, to Washington.

This flight shows the mobility of the aviation units of the Marine Corps and Navy stationed at outlying points, and demonstrates the high efficiency of the personnel, that enabled them to meet successfully the many problems of a flight of many thousands of miles over land and water

Orders to Officers

Lt. Comdr. Elwood A. Cohen, (SC) detached U.S.S. Utah, to Aircraft Squadrons Scouting Fleet as Supply Officer

Lt. Comdr. Charles R. O'Leary, (SC) detached Aircraft Squadrons Scouting Fleet to U.S.S. Utah as Supply Officer

Lieut. Gail Morgan, detached Bureau of Aeronautics to Aircraft Squadrons Battle Fleet for duty involving flying

Boson Farrell N. C. Overall, detached Glenn L. Martin Co., Cleveland to Aircraft Squadrons Battle Fleet.

Comdr. Holden C. Richardson, (C.C.) detached Naval Aircraft Factory, Phila., to Bu. Aeronautics for duty involving flying

Lt. Comdr. Charles O. McCord, detached Officer in Charge, Aeronautical Engine Testing Lab., Navy Yard, D.C., to Officer in Charge Aeronautical Engine Test. Lab. Naval Aircraft Factory, Phila.

Lieut. James D. Barner Despatch orders 10-18-23 revoked, to duty Aircraft Squadrons Battle Fleet.

Lieut. William M. Fellers, detached U.S.S. Richmond, to temp. duty Naval Aircraft Factory, Phila.

Lieut. John C. Rickertts, detached Naval Air Station Coco Solo, C.Z. to Receiving Ship, N.Y., for temp. duty

Lieut. Clifton A. F. Sprague, detached Naval Aircraft Factory, Phila., to U.S.S. Richmond.

Lieut. Leland D. Webb, detached Aircraft Squadrons Battle Fleet to Aircraft Squadrons Scouting Fleet, for duty involving flying

Lieut. (jg) Charles A. Collins, detached Naval Air Station, Anacostia, D.C., to U.S.S. Concord for duty involving flying.

Ch. Boson William Derrington, detached U.S.S. Aroostook, to continue treatment Naval Hospital, Mare Island, Calif.

Torpedo Planes Make Excellent Showing

The following report is by the Inspector of Ordnance in Charge, Naval Torpedo Station, Newport, R.I. relative to the work of the aircraft on that station on Navy Day

"The work of the aviation unit of this station on Navy Day was noteworthy. Of the four planes belonging to the station, all were ready all the time for flying duty. The torpedoes launched were done so at exact time and place designated."

Lakehurst Has Smoker with Boxing Bout

A very successful smoker was held at the Naval Air Station at Lakehurst, N. J. on the night of Oct. 10. Several boxing bouts were on the program, and were featured by very brisk fighting. An exhibition was given by the star of the station "Patsy" Moran.

Flight Orders for Enlisted Personnel

The following new schedule of flight orders for enlisted personnel in the Aeronautic Organization of the Navy is prescribed by the Bureau of Navigation under Oct. 20, 1923. This schedule supersedes all previous schedules.

(a) One for each single motored seaplane or airplane of the authorized seaplane or airplane complement of the station or squadron, plus one additional for each three planes.

(b) Squadrons or stations having in their complements twin-motored types of planes will be allowed four flight orders for each plane of that type, plus one additional for each three planes.

(c) Squadrons or stations having in their complements planes with more than two motors will be allowed five flight orders for each plane of that type, plus one additional for each three planes.

(d) One for each kite balloon on a ship or station, but the total of such enlisted personnel given flight orders will not exceed in number the enthorized kite balloon complement of the ship or station.

(e) Three per airship of the authorized airship complement up to and including airships of 105,000 cu. ft.

(f) Seven per airship of the authorized airship complement of airships between 105,000 and 500,000 cu. ft.

(g) Fifteen per airship of the authorized airship complement of airships of the rigid type in excess of 500,000 cu. ft., and less than 1,000,000 cu ft.

(h) Twenty per airship of the authorized airship complement of airships of the rigid type in excess of 1,000,000 cu ft. up to and including 1,500,000 cu. ft.

(i) Twenty five per airship of the authorized airship complement of airships of the rigid type in excess of 1,500,000 cu. ft. up to and including 2,000,000 cu ft.

(j) Thirty per airship of the authorized airship complement of airships of the rigid type in excess of 2,000,000 cu ft. up to and including 2,500,000 cu ft

(k) At Naval Air Station, Hampton Roads, Va., where planes for Atlantic Fleet are overhauled, and Naval Air Station, San Diego, Calif., where planes for Pacific Fleet are overhauled one additional flight order for each five planes of the complement of the respective Fleet based on that station.

The flight orders allowed under the above are intended for the mechanics who are detailed to the operating aircraft crews (exception under (k)). Additional flight orders will be allowed for men whose duties involve actual flying as follows:

(a) *Naval Aviation Pilots*. Enlisted men who are qualified and who are detailed to duty involving actual flying will be given flight orders.

(b) *Radio Operators*. Stations or squadrons having in their authorized aircraft complement aircraft fitted with radio apparatus shall be allowed:—

(1) Flight orders for every radioman who is regularly assigned to an aircraft which habitually carries a radio operator while in flight. In the case of airships, particularly rigid airships, more than one radioman may be carried, in which case the extra man would also be given flight orders.

(2) Flight orders for one radioman to each five aircraft so outfitted but which ordinarily do not carry a radio operator while in flight.

(c) Men under Instruction involving Flying. Flight orders may be approved by the Bureau of Navigation on recommendation of the commanding officer concerned and the Bureau of Aeronautics to men under special instruction which involves actual flying, where such instruction is part of a course approved by the Bureau of Navigation.

(d) Special Flight Orders. Flight orders may be issued to men detailed to special projects which involve flying. In such cases, commanding officers will make requests to the Bureau of Navigation via Bureau of Aeronautics for such detail, stating: (1) Nature of duty to be performed; (2) Length of time detail will continue, (3) Reason that duty cannot be performed by other men who already have flight orders.

The above is intended to cover details of a more or less temporary nature and will not be considered as a permanent increase in allowance.

In accordance with the requirements of the Budget for the fiscal year 1923-1924, Flight Orders must be issued to men in the different pay grades in accordance with the following percentages, which must not be exceeded: Pay grade 1—50 per cent; Pay grade 2—25 per cent; Pay grade 3—15 per cent; Pay grade 4—10 per cent.

Official Commendation for ZR1

Secretary Denby has sent Admiral Moffett, Chief of Naval Aeronautics, an official letter setting forth his satisfaction over the performance of the ZR1, saying "The Department feels that the trials testify to your efficient handling of this project and desires to commend you for your initiative and zeal as Chief of the Bureau of Aeronautics in bringing this important naval enterprise to so successful a conclusion.

Another letter was written to the designer of the "largest rigid airship" Comdr. Jerome C. Hunsaker, U.S.N. complimenting him on his work in the design and construction. Commander Weyerbacher, manager of construction, was also the recipient of a commendatory letter from the Naval Chief, complimenting him on the completion of the construction under his direction of the first rigid built here. Letters of similar commendation went forward to Capt. G. C. Westervelt, of the Naval Aircraft Factory, Philadelphia, where the parts of the ship were fabricated, and to Comdr. F. W. McCrary, for his excellent work at Lakehurst and the navigating of the ship

A Resourceful Pilot

The quick thinking of Lieut. A. C. McFall, piloting a Vought VE7 landplane over the landing field at the Naval Aircraft Factory at Philadelphia, averted a serious accident when one of the struts of the landing gear failed when he attempted to land. When the wheels of his plane touched the ground a warning crack told him that to complete the landing would be disastrous. He immediately opened the throttle of his engine and climbed. A hasty inspection showed him that one of the struts of his landing gear had given away. After a consultation with the observer in the plane, Comdr. H. C. Richardson, he landed the plane in the river. The water landing was made without serious injury to the plane and the two men escaped injury of any kind. The plane will be repaired.

More Mooring Masts

The Bureau of Aeronautics proposes to erect airship mooring masts 160 ft. high at San Diego, Calif., Fort Worth, Tex., and Guantanamo, Cuba. These masts, which are of the "semi-portable type", are expected to play a large part in the development of airship navigation, provided excellent temporary accommodations for rigid airships in lieu of the expensive hangar construction. The mast at Fort Worth will be adjacent to the U.S. helium production plant there.

Aircraft Squadrons Scouting Fleet

The Aircraft Squadrons Scouting Fleet, at present based on Solomon's Island, Md., have been engaged in gunnery exercises in preparation for the record practices to be held soon. Work was done in machine gunnery, both towed sleeve and camera gun, and bombing. A fixed target for bombing was placed at the entrance of the Patuxent River, and rake parties observed the fall of the bombs from favorable points.

The Radio-Sleeping Sickness

All of the radio students at the Naval Air Station at Pensacola are satisfactory in their work and will qualify on schedule time. This is attributed to the "learn-while you-sleep" method of instruction that has been followed at that station. The radio students have received instruction via the sleep method besides their regular class-room work. All of those who were low in their radio marks have been pulled up to satisfactory marks.

Great Lakes Reserve Air Station

One qualified naval aviator and four enlisted men of the Naval Reserve will be called for active duty for service with the Naval Reserve Aviation Unit which the Secretary of the Navy has authorized the Commandant of the Training Station, Great Lakes, Ill. to establish there.

Gunnery Awards to Aircraft Squadrons

As a result of the gunnery exercises held by the operating units of Naval aviation during the year 1922-1923, the efficiency pennant was awarded to Scouting Plane (VS) Squadron One, Aircraft Squadrons Scouting Fleet, commanded by Lt. Comdr. J. C. Monfort, U.S.N. The exercises were participated in by eleven Squadrons and two Naval Air Stations, those at Coco Solo and Pearl Harbor. Besides the pennant awarded to Scouting Plane Squadron One, the below listed units of the different squadrons obtained the gunnery "E". The exercises were in bombing and machine gunnery.

Unit 12, VS Squadron One, Lt. H. R. Bowes, commanding.
Unit 1, Naval Air Station, Pearl Harbor, Lt. W. S. Hector, commanding.
Unit 1, VF Squadron One, Lt. G. T. Cnddihy, commanding.
Unit 2, VF Squadron One, Lt. Comdr. P. M. Bates, commanding.
Unit 2, VO Squadron One, Lt. Comdr. G. A. Smith, commanding.
Unit 1, VT Squadron One, Lt. S. E. Haddon, commanding.
Unit 1, VO Squadron Three, U.S.M.C. Capt. L. E. Wood, commanding.
Unit 1, VO Squadron Three, U.S.M.C., Maj. R. I. Geiger, commanding.

Admiral Coontz Commends Naval Aviation

The following letter has been received by the Chief of the Bureau of Aeronautics from Admiral R. E. Coontz, Admiral of the United States Fleet.

"It gives me pleasure to extend, on behalf of the forces afloat, hearty congratulations on the recent successes in Naval Aviation. It is known that the Schneider Cup Race was especially keenly contested and the showing of the Naval entrants was further commendable in that they were operating in a foreign country. The additional successes in the Pulitzer Cup Races and the performance of the ZRI show beyond doubt the skill and loyalty of the personnel and is outstanding proof of the foresight and ability of the directing and administrative authorities, and of the high efficiency of those responsible for the training of personnel and the designing of naval aircraft.

"It is with great pride that all of us watch any Naval success, especially in such a young service as aviation."

Spotting Planes to be Placed in Service

A trial board, headed by Lt. Comdr. M. A. Mitscher has tested the first of the thirty MO1 spotting planes that are being built for the Navy by the Glenn L. Martin Co. of Cleveland. The delivery of these planes will be commenced this month.

It is planned that the first six of these planes will form an observation squadron with the Aircraft Squadrons Scouting Fleet, and they will be placed in commission before the end of the year. The second lot of these planes, eighteen in number, will be used to replace the DH4B planes now being used in the observation squadron with the Aircraft Squadrons Battle Fleet.

The MO1 is a monoplane, convertible to either a seaplane or a landplane, and as such will have a much larger usefulness than the DH4B landplanes now being used for spotting work on the West coast.

Civil Engineers Visit the Langley

On Friday, Oct. 19, about one hundred members of the American Society of Civil Engineers visited the U.S.S. Langley at the Navy Yard at Norfolk, Va. The visitors were shown around the ship by the officers, and were particularly interested in the elevator system whereby planes are brought from their berths in the hull of the vessel to the flying deck.

Pensacola Re-Enlistments High

The Naval Air Station at Pensacola, Fla., reports that since the first of July of this year over 80 per cent of the men whose enlistments have expired have either re-enlisted or extended their enlistment. This shows beyond dispute that the Naval Air Station at Pensacola is well to the fore among the "happy" ships and stations of the Navy.

PUBLISHER'S NEWS LETTER

If the readers of a publication knew the interest the letters they send to the Editor create they would write more often. From these letters are secured many suggestions that give ideas for articles of interest and editorial comment. It would be very helpful if our readers would consider themselves as an unorganized group that is keeping AVIATION in the field so that the information they secure from it will help them advance aeronautics in this country. Practically all other aeronautical papers are backed by some organization for which they speak, or, to put it accurately, some organization is kept alive just for the purposes of the publication. AVIATION has always been independent and has refused to be subsidized or controlled in any way by any group. For this reason our readers may criticize or make helpful suggestions freely. These are always welcomed.

* * * *

Many persons have asked why they could not secure AVIATION at practically any newsstand. The reason for this must be evident if the nomadic life of the flier is considered. If AVIATION were to place copies of each week's issue on only a small percentage of the newsstands of the country, it would have to print thousands of extra copies, pay the mailing charges to the newsstands and also the mailing charges back for unsold copies. This returnable privilege, few readers understand. Only papers that want to boast of large editions or where there is a large popular demand can afford to put out large editions on a returnable basis. Every copy of AVIATION that goes to a newsstand is ordered by that stand. So if you prefer to buy your copy at a newsstand, all that is necessary is to leave an order and it can be secured in any part of the United States. We earnestly hope, however, that you will subscribe regularly. It is cheaper and you are more certain to receive every copy.

* * * *

The subject of circulation is also one little understood by those unfamiliar with publishing details. It is a general impression that the greater the circulation, the more successful the publication. This is true only when the advertising rates per page increase with the circulation. In the aviation field the advertisers can only afford to pay a reasonable rate, so that a very large circulation is only an expense to the publisher. The failure of so many aeronautical publications has been due largely to this unbalanced condition of circulation and advertising. The circulation of AVIATION does not vary greatly from year to year. Its readers are those who want facts regarding the progress of aviation, presented with particular attention to accuracy and understanding of the technical features of the art. And this group of interested readers does not grow fast. The public gets its aeronautical information from the daily press and magazines. Aeronautical publications that have tried to appeal to the general public have not prospered. A trade paper is only successful when it knows its field and keeps within it.

* * * *

And while we are on the subject of aeronautical papers, it may not be inopportune to point out that some of the papers that are being published are attempting to get outside their field—or the field they claim to cover. So-called "service" publications have very definite limitations. Abuses became so great in the past that Congress made new rules regarding "service" papers. Many of them discontinued, but others incorporated as a regular publishing venture and continued. This apparent subterfuge is now running its course and publications of this sort may soon find that their "official" endorsements will become a matter of Congressional investigation. Either a publication is official and speaks with authority, or it is unofficial and a commercial enterprise. In the latter case it is manifestly unfair to pose as an official organ of a governmental service. And yet this is being done in the aeronautical field.

* * * *

In making comparisons of publications, not only the question of price and frequency should be considered, but also the care with which a magazine is edited. The latter point is perhaps of the greatest importance. AVIATION is priced at ten cents. All other publications in the field are priced at twenty and twenty-five cents. For the same expenditure our readers get more text pages for their money than they can buy in any other publication. And they get it first, which is no less important.

* * * *

These letters are intended to give our readers information that they would not get in any other way. If there are any subjects you would like discussed just let us know.

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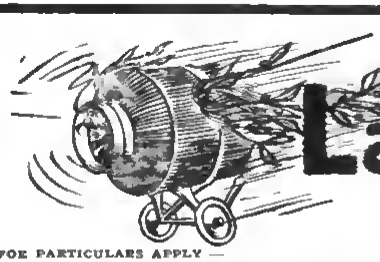

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